REPORT RESUMES

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AN EVALUATION OF SPEECH AND HEARING PROBLEMS IN THE SCHOOLS, RESEARCH PROBLEMS AND CAPABILITIES OF A RESEARCH CENTER FOR RESOLVING ISSUES PERTAINING TO SCHOOL PROGRAMS.

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RESEARCH IS NEEDED TO DETERMINE THE AGE AT WHICH A CHILD WITH A FUNCTIONAL ARTICULATORY DISORDER SHOULD BEGIN THERAPY AND THE FREQUENCY OF THERAPY. THE AUTHORS REJECTED THE SURVEY METHOD BECAUSE OF ITS MANY LIMITATIONS. RESEARCH, USING THE EXPERIMENTAL APPROACH, WAS PLANNED TO SCREEN 30,000 CHILDREN, 724 OF WHOM WOULD BE ASSIGNED TO THERAPY, SPECIAL ATTENTION, OR UNTREATED GROUPS. GRADE OF BEGINNING THERAPY AND NUMBER OF SESSIONS WOULD BE VARIED. RESULTS OF THE RESEARCH WOULD SHOW WHETHER THERAPY WAS MORE EFFECTIVE THAN VICARIOUS LEARNING AND, IF SO, WHEN AND HOW THERAPY SHOULD BE IMPLEMENTED. NOTING THAT THIS EXPERIMENTAL PROGRAM WAS NARROW IN SCOPE, THE AUTHORS FELT A NEW, MORE COMPREHENSIVE APPROACH WAS NEEDED. PLANS FOR THE EXPERIMENTAL PROGRAM WERE SET ASIDE, AND THE AUTHORS DEVELOPED A MODEL FOR A RESEARCH CENTER FOR SCHOOL SPEECH THERAPISTS. EIGHT PROJECTS WERE UNDERTAKEN TO TEST THE PLAN TO DETERMINE IF IT COULD EVOLVE INFORMATION NEEDED FOR DETERMINING STANDARDS FOR SCHOOL SPEECH AND HEARING PROGRAMS. PROJECTS INVOLVED SCHOOL EXPERIENCE AND PREPARATION IN TEST ADMINISTRATION FOR STUDENT SPEECH THERAPISTS, CHARACTERISTICS OF PUPILS RECEIVING SPEECH AND HEARING THERAPY, ASSESSING ORAL COMMUNICATION SKILLS, PROSPECTUSES (FOR STUDIES OF STUTTERING, EFFECTS OF THERAPY, REMISSION OF "R" ERRORS, AND REMISSION OF "S" ERRORS), COORDINATED RESEARCH, AND TEACHERS' RANKING OF CHILDREN'S PARTICIPATION IN DISCUSSIONS. FUNCTIONS OF A RESEARCH CENTER ARE DESCRIBED. HOW SUCH CENTERS CAN ENCOURAGE AND AID THE SCHOOL SPEECH THERAPIST WITH RESEARCH PROJECTS IS SHOWN. INCLUDED ARE A 100-ITEM BIBLIOGRAPHY AND A CASE-RECORD ABSTRACT FORM WITH INSTRUCTIONS FOR USE. (JD)

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An Evaluation
of
Speech and Hearing Programs in the Schools

Research Problems
and
Capabilities of a Research Center for Resolving Issues Pertaining to School Programs

Committee on Research, Principal Investigator
Maryjane Rees, Project Director

Final Report

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Principal Investigator
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Project No. 5-0408-4-11-3
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Maryjane Rees, Ph.D.
Project Director

January 30, 1967

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Special acknowledgment is due the American Speech and Hearing Association Research Committee responsible for initiating this project and the Research Subcommittee appointed to assume responsibility for it. The unique spirit of cooperation, the unusual flexibility and willingness to consider all opinions set forth, and the amiability with which compromises were reached that characterized this group deserve particular notice. The work contained in Section I of this report represents the cooperative efforts of the Subcommittee and the Project Director, though the subcommittee cannot be held responsible for whatever shortcomings the report contains.

At the time the project was initiated, Dean D. C. Spriestersbach was chairman of the Research Committee. Membership of these committees has included the following:

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The exemplary services of several research assistants contributed materially to the progress of the project. Project assistants have included Linda Himmelman, Rosalind Nichols, and Mary Lydon--chief assistant. Elizabeth Epperson has served in many capacities--research assistant, secretary, and participant in one of the projects. This project could not have been completed without the invaluable services of Sandra Williams, Project Secretary.

SECTION I

INTRODUCTION

In March of 1964, the Research Committee of the American Speech and Hearing Association applied to the U. S. Office of Education for a grant to plan a research program that would determine how effective school speech and hearing programs are in meeting the needs of children with speech and hearing problems. Following approval of the grant application, the Research Committee appointed an ad hoc Subcommittee to assume responsibility for directing the development of the research plan. A full-time Project Director was subsequently employed, effective February 1, 1965.

Section I of this report contains a review of the work accomplished during the seven-month period from February to August. The research design developed during that time represents the cooperative efforts of the Research Subcommittee and the Project Director. The research proposal was submitted to the ASHA Research Committee in August, 1965.

In September, 1965, with the approval of the ASHA Research Committee, the Project Director began developing an entirely different approach to resolving some of the issues and problems attendant upon school speech and hearing programs. The results of this approach are contained in Section II of this report.

The orientation of the project assigned to the Research Subcommittee and the Project Director is contained in the following statements taken from the grant application:

> The deleterious effects of speech and hearing problems on the communication process have been well documented and accepted. As a consequence, the members of a large professional organization, The American Speech and Hearing Association, are dedicated to the task of modifying deviant speech patterns into more acceptable ones. Millions of dollars are spent annually to support institutional training and research concerned with providing the information and trained personnel required to provide effective services for persons with speech handicaps. The major portion of the efforts of this professional group is devoted to programs involving public school children.
>
> How crucial are the needs for increased support of speech and hearing programs for children in the public schools? What are the needs for professional personnel, equipped with what knowledge and skills, at what levels

of formal training? The effectiveness of existing programs must be determined before these questions can be properly answered.

It must be recognized that the development of increased communication skills is related to the maturation process. How many of the communication problems would be eliminated simply because children grow older and become more mature? Is there a higher incidence of communication problems among high school drop outs? Are a large number of children who have significant communication handicaps being graduated from high schools? What is the difference, if any, in the number of such children coming from systems with speech and hearing programs as contrasted with the number of children coming from systems without such programs? Basically, are existing programs designed to serve the needs of those children who would be seriously handicapped upon completion of their public school training if they did not have such help? The study proposed in this application will be designed to obtain answers to these questions.

It is the long-range objective of this study to conduct an intensive, longitudinal evaluation of selected speech and hearing programs located in a variety of cultural settings throughout the United States. For example, the communication skills of the children in these school systems will be compared with those of children from comparable schools without such programs.

A. The Problem

One of the unresolved issues in school therapy programs, implicit in the preceding discussion, is the age or grade level at which a child should receive assistance with his speech. The issue of early or delayed therapy pertains primarily to children with "functional" articulatory deviations. The significance of this question with respect to the efficiency and effectiveness of school programs is readily illustrated by results of a survey reported by Bingham and others (12, pp. 35-36). Articulatory problems comprise an average of 81% of the caseload of the average school clinician. About 75% of the school clinicians work primarily with children in kindergarten and the first and second grades.

The heavy concentration on early speech therapy, coupled with the evidence that the major portion of children in caseloads have articulatory deviations, is a source of concern to many individuals, particularly since articulatory patterns of young children change with age without formal assistance. Therefore, the proponents of the maturation theory of articulation development question whether the skills of speech clinicians and the funds that subsidize therapy programs are being judiciously used.

B. Review of Related Research

An investigation designed to produce conclusions about the appropriateness of providing early therapy in school programs is beset by many problems. Attempting to determine the need for therapy on the basis of the child's age and the number of his articulatory errors is an over-simplification. Furthermore, it is doubtful whether maturation is the primary variable on which speech behavior depends at the age of entering school. Speech is a learned behavior; as such, it depends upon the many factors that affect learning.

The significance of articulatory errors extends beyond whatever the effects of negative feedback may be to lack of precision in the acoustic code. The relation between articulatory deviations and disabilities in other aspects of language skills needs to be considered as one of the determinants for the need for early therapy. Unfortunately, the extent of this association has not been clearly defined, though it is known to exist in many cases. In general, articulatory deviations have been viewed as homogeneous, whereas evidence is emerging that lends weight to the hypothesis of heterogeneity. Thus, the number of errors by age level may well be a superficial measure of the severity of the deviation and its concomitant educational implications.

Knowledge about the effects of therapy on articulatory skills is far from complete. In addition, many of the important aspects of school therapy programs, such as case finding, case selection, caseloads, and scheduling, vary considerably from one program to another, making it impossible to describe a standard or typical program.

Development of Articulatory Skills

Many children have not completely mastered articulatory skills by the time they have reached the age of entering kindergarten or even first grade (21, 22, 55, 62, 70, 71, 85, 92). Even though a number of studies have been concerned with articulatory development, detailed scrutiny of the resulting data does not produce confidence that we are able, even today, to make adequate or reliable judgments about normal as opposed to defective articulatory behavior in young children. Examination of the more frequently cited studies shows many instances of substantial disagreement about the age at which specific articulatory skills develop. Some of these discrepancies are shown in Table 1.

Templin's (85) norms pose several problems. The variances of mean scores for different age levels, whether considering the total sample or the various subsamples, are so large in most instances that significant differences between means for adjacent age levels do not obtain. Still another difficulty is that the norms are based on means, yet the distributions Templin obtained are severely skewed--only the distribution for three-year-olds being normal (p. 28).

Table 1. Age at which 75% of Wellman's (92), Templin's (85), Poole's (62) samples and 100% of Davis's (21) sample produced various sounds correctly. The Roe-Milisen data (70) show the percentage of children articulating the sounds correctly at grade one.

Sound	Wellman	Templin	Poole	Davis	Roe & Milisen (% Correct--Grade 1)
/f /	3	3.0	5.5	5.5	89.1%
/l /	4	6.0	6.5	6.5	93.8%
/r /	5	4.0	7.5	8.0	82.4%
/s /	5	4.5	7.5	5.5	51.1%
/θ /	5	6.0	7.5	6.5	31.2%
/ʃ /	5	4.5	6.5	6.5	85.6%
/v /	5	6.0	6.5	5.5	47.0%
/ð /	5	7.0	6.5	6.5	42.7%
/z /	5	7.0	7.5	5.5	11.1%

Medians are a better measure of central tendency when distributions are skewed. Comparison of median and mean number of correct items on the 176-item test, beginning with age 3.5 years, illustrates the rather large discrepancies between these measures of central tendency. These differences are shown in Table 2. Obviously, children have better articulatory skills than the norms based on means imply.

Another difficulty with the developmental data that we now have is that they do not appear to adequately account for articulatory inconsistency. To what extent the Templin norms would be altered or qualified by more detailed testing of sounds in numerous phonetic contexts or by measures of stimulability, or both, is not known. Inconsistency was discussed as early as 1931 by Wellman and others (92) and has been well documented by Buck (15), Hale (32), Nelson (59), Anderson (2), and Curtis and Hardy (20). Spriestersbach and Curtis (82) and McDonald (52) have reviewed the concept of inconsistency. McDonald (52, p. 172) concluded that information about the consistency of correct articulation is needed to supplement normative data based on the age at which 75% of the children correctly articulate individual sounds.

Maturation versus Learning

The concept of maturation as a major factor in articulatory development, though generally accepted, must be seriously questioned for a number of reasons. Roe and Milisen (70) concluded that significant reduction in misarticulation occurs from grades one to four--a conclusion that has been widely quoted; nonetheless, their data actually show that from grades one to six there is no reduction in the percentage of children misarticulating nine of the sounds tested. Their data are shown in Table 3.

Increased articulatory skill with age, as shown by the Templin data, is not necessarily evidence that "maturation" or age is the variable on which articulation skills depends after about four years of age. As shown in Tables 4 and 5, differences between mean scores from both the 176-item articulation test and the 50-item screening test are significant for the following age groups: 3 - 3.5, 3.5 - 4, and 3 - 4. Differences between mean scores from either test for the age groups 4 - 4.5, 4.5 - 5, or 4 - 5 are not significant. The differences between mean scores from the 176-item test for 5- and 6-year-olds is significant at the .05 level of confidence only. Differences between mean scores from the 50-item test for these age groups is not significant. In contrast, differences between mean scores from both tests are significant at the .01 level of confidence for 6- and 7-year-olds, and at the .05 level for 7- and 8-year-olds only.

These data suggest that "maturation" stops at about four years of age. The difference between the 6- and 7-year-olds is just as likely to be due to the influence of the structured learning environment and peer-group pressure on acquisition of correct articulation found in first grade as it is to reflect maturation.

Table 2. Median and mean number of correct items from the Templin 176-Item Test (Templin, 85, pp. 27, 170). N = 60 at each age level.

CA	Medians	Means	Difference
3.0	94.7	93.3	1.3
3.5	122.7	111.9	10.8
4.0	133.5	126.4	7.5
4.5	138.0	129.2	8.8
5.0	155.3	135.3	20.0
6.0	165.8	150.3	15.5
7.0	170.2	161.9	8.3
8.0	170.5	167.1	3.4

Table 3. Percentage of children making errors (Roe and Milisen, 70, p. 42).

Sound	Grade 1 (N=492)	Grade 6 (N=239)
/z/	88.1	84.5
/hw/	43.2	44.7
/d/	70.1	68.8
/t/	45.7	55.6
/b/	26.0	29.2
/k/	13.0	17.9
/f/	10.9	11.2
/p/	5.0	13.8
/l/	6.2	7.9

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/hw/	43.2	44.7
/d/	70.1	68.8
/t/	45.7	55.6
/b/	26.0	29.2
/k/	13.0	17.9
/f/	10.9	11.2
/p/	5.0	13.8
/l/	6.2	7.9

Table 4. Differences between means and t ratios by age levels for the Templin-Darley 176-Item Articulation Test. Computations are based on data from the test manual (Templin and Darley, 57, p. 18). Differences significant at the .05 and .01 levels of confidence are marked S.

CA in Years	Means		Diff	t ratio	Confidence Level .05	.01
3 - 3.5	93.3	111.9	-18.6	2.94	S	S
3.5 - 4	111.9	126.4	-14.5	2.44	S	S
3 - 4	93.3	126.4	-33.1	5.69	S	S
4 - 4.5	126.4	129.2	- 2.8	.50		
4.5 - 5.0	129.2	135.3	- 6.1	.98		
4 - 5	126.4	135.3	- 8.9	1.46		
5 - 6	135.3	150.3	-15.0	2.45	S	
6 - 7	150.3	161.9	-11.6	2.61	S	S
7 - 8	161.9	167.1	- 5.2	1.91	S	

Table 5. Differences between means and *t* ratios by age levels for the Templin-Darley 50-Item Screening Test. Computations are based on data from the test manual (Templin and Darley,87, p. 19). Differences significant at the .05 and .01 levels of confidence are marked S.

CA in Years	Means		Diff	t ratio	Confidence Level	
					.05	.01
3 - 3.5	21.3	27.8	- 6.5	2.58	S	S
3.5 - 4	27.8	34.4	- 6.6	2.83	S	S
3 - 4	21.3	34.4	-13.1	5.87	S	S
4 - 4.5	34.4	35.8	- 1.4	.67		
4.5 - 5	35.8	37.7	- 1.9	.82		
4 - 5	34.4	37.7	- 3.3	1.47		
5 - 6	37.7	41.4	- 3.7	1.63		
6 - 7	41.4	45.9	- 4.5	2.68	S	S
7 - 8	45.9	47.8	- 1.9	1.92	S	

It may appear naive to mention that speech is a learned behavior; nonetheless, the prevalence of the concept that children "outgrow" their speech differences warrants examination, particularly since the appropriate age for enrolling children in school therapy programs is the focus of considerable controversy. To be sure, children's speech changes with age up to a point; however, no learned behavior is independent of the learning situation in which it is acquired. Children's speech behavior is shaped and reinforced from earliest infancy. Speech is learned by imitation--an inefficient method of learning--under haphazard conditions of social reinforcement applied by parents, who, as a whole, have relatively little insight into effective contingency management.

It is essential that early speech attempts, which are necessarily imperfect, be positively reinforced. Unfortunately, the very reinforcement so necessary for speech development can also cause it to be maintained at levels unnecessarily low unless some care is taken to assist the learning process. Parents' interest in teaching speech seems to diminish rapidly after the infant has learned to say a half-dozen or so words. The child's early attempts to manipulate his environment through speech are positively reinforced--he receives something to eat or the toy he wants--and little attention is paid to further shaping increasingly precise and complex speech behavior.

The work now being accomplished in the area of behavior modification, with its de-emphasis on concepts such as maturation (Krasner and Ullmann, 47, p. 3), lends further weight to our need to re-examine the notion that delayed maturation accounts for poor articulation that is "functional" in nature by the age of entering school.

Staats's (Staats and Staats, 83) work indicates that the average child has the potential to read much earlier than he now does if reinforcement conditions are suitably controlled. Since Staats has shown that the same learning principles apply to both speech and reading, it follows that better speech and language at earlier ages should also be possible.

Indirect evidence of the effects of learning environment comes from studies comparing speech development of children from different socioeconomic strata. Though socioeconomic status is generally assumed to be a factor influencing speech development, the data are somewhat contradictory. Researchers who have found a positive relationship between low socioeconomic status and inferior speech development are Gesell and Lord (29), O. C. Irwin (38), Becky (8), McCarthy (50), and Smith (76). Weaver (Weaver and others, 90, p. 175) found "Only the two lowest occupational classes affect significantly the number of articulatory defects exhibited by children with dyslalia." Weaver noted that his findings were in conflict with previous research.

Research results based on populations selected according to the rural-urban dichotomy are equivocal. Louttit and Halls (48) found more children with speech defects in country than in city schools.

In contrast, M. J. M Wilson (94) found more articulatory defects in her urban population than in her rural population. In general, the urban-rural dichotomy reflects differences in socioeconomic level.

Other studies lead to different conclusions. Norms for both upper and lower socioeconomic groups are provided for the Templin-Darley (87, pp. 18-19) 176- and 50-Item Articulation Tests. Though the means for each age level are consistently lower for the group with low socioeconomic status, the only difference between means large enough to be significant at the .05 level of confidence is that for 4.5-year-olds derived from the 176-item test. Templin's population did not, however, include children living in rural communities. Everhart's (26, p. 338; 25) conclusion is even more definite: "The factor of paternal occupation is not related to the occurrence of articulatory deviations." He confirmed this conclusion in 1956.

The effects of the learning situation on phonetic production can be inferred from O. C. Irwin's (39) study. Mothers in his experimental group instituted a program of reading and story telling when the children were 13 months old. The program continued until the children were 30 months of age. The difference in phonetic production between the experimental and control groups was nonsignificant until the children were 17 months old; thereafter, the difference increased consistently throughout the experimental period, with the experimental group producing phonemes with significantly greater frequency than the control group. Certainly, the quality of speech and language development of most of the children in Head Start programs is evidence of the effect of environment on speech development.

Additional evidence of the effects of training on articulatory development comes from the follow-up study of B. A. Wilson's (93) population by Andersland (1). This group of children had received speech-improvement training while in kindergarten. Five years later the speech of these children was such that Andersland (1, pp. 84-85) concluded that the kindergarten training program had enabled children of the low socioeconomic level to " . . . attain a level of articulation achievement approximating that of middle and upper socioeconomic group members." Results of this training was significant for only the children from homes of low socioeconomic status. Differences in articulation between trained and untrained groups from middle and upper socioeconomic classes were nonsignificant. Furthermore, " . . . none of the lower-class children who did not receive speech training had errorless articulation after the five-year period."

These data suggest that the amount, kind, and quality of speech stimulation in the home is perhaps the most important factor in the early development of articulatory skills. Apparently, families in the middle and upper socioeconomic classes assist their children in learning speech more effectively than families of low socioeconomic status, since the achievement of the latter groups of children is affected significantly by instruction.

Within limits, the above evidence argues against the use of norms for articulatory development based on mean performance by age for determining the need for speech instruction by age of entering school. Such norms imply that maturation of cognitive, sensory, and neuromuscular systems set the limits of speech behavior in normal children, whereas the evidence indicates that instruction, informal or formal, is the primary variable. More realistic norms for determining a child's need for additional assistance would be based on mean achievement of children whose speech-learning environment has been controlled. Unfortunately, we simply do not know what young children's capabilities for learning good speech are when the many factors affecting learning have been held constant.

Some years ago, Milisen (54, p.6) said, " . . . defective articulation, a substitute response for normal articulation, results from the disruption of the normal learning process." Faulty stimulation or assistance in the home may be the cause of disruption of learning; or, more simply, inadequate stimulation and assistance preclude adequate learning from developing.

Winitz and Lawrence (97, p. 266) found no difference in the ability of kindergarten children with good and poor articulation to perform a non-English sound task. Since physical and psychological factors were thus contraindicated as affecting the subjects' performance, they concluded: " . . . it would appear reasonable to assume that certain, as yet unidentifiable, learning factors which have operated in the past may account for differences in their [children with poor articulation] articulation functioning." Based on a review of research about articulation and intelligence, Winitz (96, p. 296) questioned the value of additional research involving correlations between articulation and intelligence or other measures of growth. Concluding that articulation behavior is subject to stimulus and reinforcement conditions, he recommended that it be studied in the framework of learning theory.

Articulatory Deviations and Personality

Speech deviations are thought by many to affect personality adversely. This contention, as far as individuals with articulatory disorders are concerned, is not substantiated by evidence from research. Spriestersbach (81, p. 334) stated, " . . . one is forced to conclude that the contribution of research to an understanding of the relationship between articulatory defects and personality is largely negative." Based on an extensive review of the literature, Goodstein (31, p. 363) arrived at a similar conclusion: "At present the only possible conclusion is that the relationship between personality factors and articulation disorders has not been clearly demonstrated and much additional research is required."

The evidence contraindicates using measures of personality as one of the criteria for determining the significance of or extent to which articulatory deviations are handicapping. Similarly, such measures would be unlikely to reflect the results of treatment. Either the negative feedback resulting in this kind of speech deviation has no consequence--a conclusion contrary to clinical experience--or test instruments are not sufficiently sensitive to detect it. A third alternative is possible; namely, failure to identify subcategories of articulation disorders may have obscured the deleterious effects of certain types of deviations.

Speech Deviations and Other Language Disabilities

Perhaps the most obvious criterion for judging the significance of a speech disorder is the degree of association between the disorder and other language disabilities. This association is of particular importance in the school situation. Children whose speech problems make failure in learning to read a potential threat are, without doubt, in need of early assistance.

Among the investigators who have found a relationship between reading difficulties and speech difficulties are Bennett (9), Betts (11), Eames (24), Everhart (26), Hildreth (36), Jackson (42), Monroe (56), Moss (58), Robinson (69), Witty and Kopel (98), and Yedinak (99). Bond (14) and Moss (58) found articulatory errors associated with oral reading difficulties, while Hall (33) and Moore (57) found no difference in silent reading performance of defective and normal speakers. From a review of the literature, Artley (7, p. 359) concluded: "Studies indicate that speech defects may be the cause of reading defects, the result of reading defects, or the two may exist side-by-side as a result of some common factor."

A more definitive statement was made by McCarthy (51, p. 514) who observed:

> When a child whose speech is not developing normally is examined carefully, it is usually found that there have been anomalies of language development present in one form or another throughout his life. Whether a child is referred to a speech therapist, to a psychologist, or to a remedial reading teacher is largely a matter of timing.

She prefers the more general term, language disorder, since it focuses attention on the entire syndrome rather than on a single symptom predominating at a particular time.

Falck and Falck (27, p. 439) have made similar observations:

> A surprisingly large number of persons seen for diagnostic study in a speech and hearing facility evidence disorders of language beyond those obviously involved with their "speech" or "hearing" problems. Many children referred to a clinic because of obvious speech problems have somewhat less obvious (but equally real and handicapping) language disabilities in the areas of reading, writing, and spelling.

> Some children now being referred to speech and hearing facilities have little or no speech problems, but come in with a chief complaint of extensive scholastic difficulties. There may be a past history of a speech problem which helps to direct the parents to a clinic . . . .

Using a generative model of grammar for comparing language skills, Menyuk (53, pp. 119-120) reported finding no child with deviant speech in the three- to six-year age bracket whose grammatical production matched or closely matched the grammatical production of a child with normal speech from two years on. She further stated that the children with defective speech " . . . seemed unable to move much beyond the use of sets of elementary and generalized rules. This seemed to be also the case with the articulation difficulties found in this group."

Additional evidence that articulatory deviations are sometimes one of the manifestations of a pervasive language disability comes from the concept of cluttering. This disorder has long been recognized in European literature (Arnold, 6; Weiss, 91) but is only now receiving attention in this country. Cluttering is the end result of a condition termed congenital language disability by Arnold (3,4, 5,6) and central language imbalance by Weiss (91). The condition designated as disordered integrative mechanism by Falck and Falck (27) encompasses the same syndrome. The symptoms include delayed onset of speech, severe and prolonged articulatory disorders, and poor grammar. Later on, reading, writing, and spelling difficulties become apparent.

Van Riper (89, p. 148) finally noted this syndrome: "Among the problems which may be viewed as the residue or aftermath of delayed speech are severe articulation disorders: cluttering . . . and a pattern of behavior which has been termed 'specific language disability.'"

Powers (63) recognized two categories of functional articulation disorder: misarticulation of specific speech sounds or groups of sounds and general oral inaccuracy. She further states that conditions termed oral inactivity and cluttering may be subsumed under the term general oral inaccuracy. Nonetheless, cluttering or oral inactivity is rarely used today as a diagnostic category.

Two of the symptoms observed by Arnold (3,5) Luchsinger and Arnold (6), Weiss (91), and Falck and Falck (27) have received little attention by students of articulatory disorders. These are poorly developed lateral preference and the hereditary nature of some articulatory disorders.

Johnson and House (44) found handedness related to severe functional articulatory disorders, though Everhart (26) did not find such a relationship. Subirana (84, p. 82), quoting from an extensive bibliography of international literature, as well as from his own experience, concluded:

> . . . dominance, laterality, and their disorders per se do not cause a disorder of language; rather, they are concomitant symptoms, reflecting on a parallel level the basic deviation of brain function that is responsible for both the disorders of language and of laterality.

Heredity in relation to articulatory disorders has been all but ignored in our literature. Powers (63, p. 747) covers heredity with a single statement under the heading of "other physical variables":

> Such factors as general physical debility and poor health, a history of frequent illness, especially during the speech learning years, developmental slowness, glandular deficiencies, "heredity" or "biological inferiority," and others.

Among the authors of the better-known texts on speech pathology, only Berry and Eisenson (10, p. 89) discuss heredity:

> Retarded speech is more than a chance occurrence in many families. The comment, "His father could not talk plain until he was in the upper grades," appears in case records with such regularity that inheritance of a defective central nervous system must be given as one cause of retarded speech.

In congenital language disability, the ratio of males to females is about four to one (Arnold, 6, p. 397). The sex ratio alone indicates that chance is not operating as it would be if the disorder were due to exogenous conditions. Winitz's (95, p. 384) conclusion that the hypothesis of no language difference between sexes is tenable on the basis of his population of five-year-olds lends further significance to the above sex ratio.

Obviously, some articulatory disorders are early manifestations of a pervasive language disability. Early therapy is necessary to preclude, or at least minimize, subsequent educational failure. It is equally obvious that a simple count of errors related to age is likely to prove inadequate for identifying the children whose language disability will interfere with the more complex skills of reading, spelling, and writing.

Some additional studies in the area of spelling should be cited. Buckingham (16), Gates (28), Ham (34), Schonell (72), and Pass (60) considered that defective articulation was related to poor spelling. But Carrell and Pendergast (17) found no such relationship. This conflicting evidence appears to indicate that articulation and spelling disability obtains for some individuals, but not all. Here, again, it seems likely that an approach that fails to take into account possible differences within the population of individuals who have articulatory deviations obscures much needed knowledge about this condition.

Heterogeneity of Articulatory Deviations

Our present approach to defectiveness of articulation appears to be based on the assumption that articulatory deviations are homogeneous. Only two investigators have addressed themselves directly to a hypothesis of heterogeneity. Trapp and Evans (88, p. 176) stated, "There does seem to be little justification for treating all functional articulatory cases as a single homogeneous group . . . ." They tested a hypothesis about performance on a nonverbal task and confirmed their contention.

Prins (64,65) also found evidence supporting the hypothesis of heterogeneity. In his first study (64), he found differences among three subgroups identified on the basis of interdentalization of /s/ and /z/, ommission-type deviations, and phonemic sound substitutions involving alteration of only a single sound feature of the intended phoneme. A fourth group--nonphonemic distortions involving alteration of all articulatory features, either individually or in combination--was suggested by his data. His study of motor and auditory abilities (65) lends further credence to the concept that articulatory deviations are more meaningfully regarded as heterogeneous than homogeneous.

Response to Treatment

Two areas of response to treatment deserve consideration. The first area is concerned with the effects of speech improvement or therapy on linguistic skills. The second is the effect of treatment on articulatory skills.

Jones (45) found that speech training accelerated reading achievement of normal second-grade students. Sommers and others (78,79) found that speech-improvement lessons significantly improved reading-factor scores (aptitude for reading, auditory association, word recognition, and word attack) for first-grade children. Speech therapy, on the other hand, did not produce significant improvement in reading-factor scores. At the end of the second grade, reading comprehension was not improved by either speech-improvement lessons or speech therapy, except for a group of 25 children with severe articulatory disorders who received speech therapy. Wilson (93) found that speech-improvement instruction did not affect reading-readiness scores of kindergarten children. Zedler (100) showed that speech improvement accelerated spelling achievement. In contrast, Durante (23) and R. B. Irwin (40,41) found no improvement in reading or other selected linguistic skills as the result of speech therapy.

This body of evidence is rather inconclusive. Here, again, reliance on measures of central tendencies only and failure to explore within-group difference may have obscured important information.

Reid (68) reviewed research to that date about the effects of speech therapy for children. A. T. Sommer (see Reid, p. 305) found children from 26 to 59 months of age improved in articulation, but those receiving speech training 15 minutes daily made significantly more improvement than their matched controls. Backus (see Reid, p. 305) published results of a therapy program started in kindergarten in which 332 of the original 375 children developed correct articulation in a two-year period. She attributed this result to speech training, but no control group was employed. In contrast, Reynolds (see Reid, p. 306) concluded in 1939 that kindergarten children receiving seven months of training made no more improvement than untreated children.

Berry and Stoddard (see Reid, p. 304) found that six months of speech improvement for lispers produced significant improvement in comparison with lispers not receiving treatment. Ness (see Reid, pp. 304-305) found the stimulation method more effective than the response method for treating children with articulatory defects. Davis (see Reid, pp. 305-306) found fewer speech defects in the third grade in a school with a speech program than in a comparable school without such a program. Furthermore, not only were there fewer speech-defective children, these children had fewer errors.

Reid's experimental study with children in grades one through eight indicated that the children who received therapy twice weekly in small groups for periods of 30 to 40 minutes made significant improvement in a five-month period compared with untreated children. The number of children treated at each grade level was too small to assess the relative effectiveness of grade level at the time treatment was introduced. She concluded: "Speech re-education, as demonstrated in this study, is a rapid and effective method of teaching correct speech patterns to children above kindergarten level." (p. 312)

In a 3.5-week clinical program in which children received therapy for one hour, four days weekly, Sommers and others (80) found about the same increase in mean number of correct sounds in their experimental group (mothers trained) and in their control group (mothers not trained). The experimental group had greater reduction in substitutions and distortions than the control group. Tests at a later date showed the control group achieved greater reduction in omission-type errors.

In another study, Sommers (77) found that children whose mothers had been trained to assist with remedial procedures made significantly greater progress than children whose mothers had not received this training. Therapy was given five times weekly for four weeks. Individual therapy was scheduled for 30 minutes; group therapy was scheduled for 50 minutes, with group size ranging from three to five children.

Sommers and others' (78) study of the effects of speech therapy and speech improvement on articulation indicated that while speech improvement resulted in significantly improved articulation for first-grade children, nine months of weekly speech therapy resulted in even greater improvement. The therapy period was about 45 minutes weekly, and mean group size was 4.5. They also found that three months of weekly therapy produced results equivalent to nine months of speech improvement scheduled for 30-minute periods weekly. Speech clinicians conducted the speech-improvement program in classrooms.

Results of a study of various durations of speech improvement on articulation improvement by Sommers and others (79) showed that nine months of speech improvement was superior to 16 weeks of speech improvement initiated at mid-year. Subjects were first-grade children. Subsequently, eight weeks of speech improvement was given to second-grade children who had received nine months of this kind of training while in first grade. Articulatory progress for this group was no greater than the progress of two control groups. One control group had received speech improvement in first grade, and the other had received no treatment.

In contrast with the above findings, R. B. Irwin (40,41) found that speech therapy did not produce significant changes in articulation scores for either first- or second-grade children.

Summary

From this review of the literature, it is evident that developmental norms leave much to be desired. Current norms are based on chronological age and do not satisfactorily take into account the numerous variables that affect learning. Furthermore, these norms are quantitative. They do not encompass adjustments for important qualitative aspects of speech and language behavior.

In some cases, articulatory disorders seem to be an early manifestation of a pervasive language disability. Failure to identify subgroups within the broad category of articulation deviations may be the cause of conflicting evidence about the relation between speech and other language difficulties. It may also have obscured the real effects of therapy on language skills for certain kinds of cases.

Objective data about the effects of therapy on articulatory skills are not extensive enough to furnish guidelines for results that might be expected in school speech and hearing programs.

C. The Survey Approach

The orientation of the grant application indicated that the answer to one of the major questions about school programs could be obtained through a survey. Examined in detail, a survey has inherent limitations for resolving the issue of the appropriate time for treating articulatory deviations.

Equivalent Populations

The assumption of random samples from the same parent population prior to treatment cannot be met. Unless this assumption is met, results of the survey would have no meaning. Furthermore, the treated and untreated populations must be maintained in the same learning environment during the course of treatment. If this precaution is not taken, the results, whatever they may be, will be confounded with learning environment, and it would be impossible to isolate the effect of treatment per se.

In many instances, real differences between school populations that have speech and hearing services available to them and those that do not seem to exist. Generally speaking, schools that do not provide special services are located in economically depressed areas or in rural communities. Socioeconomic status is assumed to be a factor in speech development, though the evidence is somewhat contradictory (see pp. 10-11). A review of pertinent investigations at least indicates that an assumption of no difference in speech development between upper and lower socioeconomic groups would be open to question.

The effects of kindergarten experience, school curriculum, and quality of classroom instruction on speech development have not been specified clearly to date. Kindergarten classes are not always provided in schools located in economically depressed and rural areas. These schools tend to have difficulty competing for the best-qualified personnel. Often they do not have the pupil personnel services and curriculum consultants that contribute to the learning environment. Some rural schools that might otherwise have a financial base to support speech and hearing services cannot support them because the schools are too small to warrant employing a full-time clinician, and distances between schools are too great for sharing the services of one person.

Parochial schools are the one source for untreated populations that are located in communities with treated populations. Obvious differences in home background, school financing, school curriculum, teacher background and preparation, and, very often, class size exist between parochial and public schools. The fact that children with the more severe speech difficulties are often sent to public schools in order to receive help with their speech would distort the comparison of treated populations drawn from public schools and untreated populations drawn from parochial schools.

The above considerations negate the tenability of assuming random sampling from the same parent population prior to treatment. They also show that the learning environments in which treated and untreated groups are maintained differ. As a result, differences in the prevalence of speech deviations in treated or untreated groups would be confounded with socioeconomic status, community size, school curriculum, school practices, school personnel, and religious-group differences.

Population Contamination

Survey data intended to show the effects of treatment based on prevalence of speech deviations in treated and untreated populations would be spurious for reasons other than the inability to meet the assumption of no difference between the groups prior to treament and lack of control over learning environment once treatment is begun. Neither treated nor untreated school populations exist as "pure cultures."

Treated populations may have an unduly high concentration of children with severe speech deviations. Conversely, untreated populations may have a spuriously low percentage of children with speech problems. Families sometimes move to communities where schools provide speech and hearing service for the specific purpose of obtaining this service. Children may be sent to live with relatives or placed in foster homes in communities where service is available, or they may be transported daily to nearby districts that offer speech services. Servicemen and officers who have children with speech deviations frequently request and receive transfer to areas where schools provide speech and hearing services.

Some schools without speech and hearing programs are located in communities where speech services are available through agencies such as Easter Seals, medical facilities, college clinics, private practice, and so forth. Some of the children may be served by mobile therapy units sponsored by a service organization.

When services are not available in the immediate community, children with speech disorders are often taken to some distant service agency for diagnosis and intermittent treatment. Other children are enrolled in camps or residential programs serving speech- and hearing-handicapped children during the summer months. Parents may take up residence in a community offering such service for the summer only. Children may live with relatives or be placed in foster homes for the summer so that they may receive some help.

In addition to children who have received some kind of intermittent or short-term service, untreated populations will contain children who have received systematic service by virtue of previous attendance at schools where either therapy or speech improvement in the classroom or both are a part of the educational services provided.

Not only will populations identified as untreated contain children who have been treated, populations identified as treated will contain children who have not been treated. Few, if any, programs are sufficiently staffed so that each and every child who needs service receives it. Even if staff size did not constitute a limitation, differences among treated groups would continue to exist, because criteria for that which constitutes a speech deviation remains a matter of value judgment, and value judgments inevitably vary.

The number of children with speech deviations that will be found in any treated population will depend in large part on case-selection practices. Case identification is achieved through speech screening and referrals. Usually, screening is limited to the primary grades, with the responsibility for case identification in the upper grades falling to classroom teachers. Students transferring to a school in grades no longer screened may be overlooked by classroom teachers. Sometimes the teacher does not have an adequate sample of the child's speech, because the student is reluctant to participate in discussions. Some teachers feel that class work takes precedence over the need for assistance with oral communication skills and are unwilling to refer for a service that might compete with class time.

School policy may dictate selection on the basis of severity, as well as mandate the age or grade level at which therapy may be initiated. Caseload restrictions coupled with staff size usually mean that many children cannot receive service. Where extensive waiting lists exist, and they do in many schools, clinicians can usually choose cases on the basis of personal preference for working with certain types of problems. Availability of physical facilities, the amount of therapy time allocated to each school, and the need to coordinate children's therapy schedules with certain classroom activities may determine whether a child receives service, quite independent of the severity of his speech disorder. Classroom teachers' objections to removing children from classrooms or lack of parental cooperation may be deciding factors. Any one of these circumstances or a combination of them may have precluded therapy for a number of children.

In comparison with instruction in reading or arithmetic, for example, which is given to all children in the school, assistance in learning better speech is provided to only a selected group of children within the school's population of children with speech differences. Most often the services are available to whatever number of children the clinician can accommodate, selected by criteria that vary widely, not only from school district to school district, but from clinician to clinician within a given school district and from school to school assigned to a particular clinician. A number of fortuitous circumstances also function to limit case selection. Thus, the prevalence of speech deviations in any "treated" population, when prevalence is determined by a survey, cannot be said to reflect either the effectiveness or ineffectiveness of therapy.

In order to compare treated and untreated populations, it would be necessary to exclude children who have not received therapy from the treated population and those who have received therapy from the untreated population. Determining each child's status with respect to whether he had received therapy would be extremely time consuming and expensive. Not only would school records have to be searched, parents would have to be interviewed. On the whole, parents provide rather inaccurate information. Many parents would not even know whether speech improvement in the classroom, as a form of treatment, had been a part of the child's early curriculum. And most unfortunately, parents do not always know whether a child has received or is receiving speech therapy. Furthermore, for really accurate comparisons, it would be necessary to ascertain which children in the treated population have received service in addition to that which is provided by the school. The investment of the time required to obtain this information would be so great for the quality of information received that the undertaking would be unreasonable.

Even if these data could be easily obtained, they would be of help only if the prevalence of speech deviations in the populations served by schools with and without speech programs could be shown to be equivalent at the outset. Previous discussion has indicated that such an assumption is unsound.

The Treatment Variable

Even if it were possible to find populations comparable in every respect except for treatment, the survey has yet another limitation. The variation in school therapy programs makes it all but impossible to specify clearly and unequivocally that which is meant by treatment. Such factors as amount of clinician training, credential requirements, tenure of the program, ratio of clinicians to school enrollment, qualifications of supervisors, program financing, and stated maximum caseload can be determined and accounted for. Other important variables, ones more likely to have a direct effect upon the change in children's speech patterns, could be determined, at best, with great difficulty and little accuracy.

Scheduling practices, type of therapy, dismissal criteria, and ancillary instruction and services are not constant from school to school or even within a particular school. Some children are seen individually, while others are seen in groups. Though average group size is four or five (Bingham and others, 12, p. 38), groups range from two to ten or more. Group composition is equally variable. Grouping may be heterogeneous or homogeneous with either age or type of problem as the grouping variable.

Length of the therapy period is variable. Bingham's (12, pp. 39-40) survey indicated that 29% of the 705 respondents used 15- to 24-minute periods for groups, while 57% used 25- to 34-minute periods. A few respondents reported therapy periods ranging from 35 to 54 minutes, as well as therapy periods of less than 14 minutes. Length of therapy sessions for children seen individually was reported to be equally variable; 40% of the 705 respondents used 15- to 24-minute periods, 36% scheduled 25- to 34-minute sessions, 10% reported sessions of less than 15 minutes. The remaining 2% used 35- to 54-minute periods.

Frequency of therapy periods is also variable. Data from the same survey indicated that 43% met individuals and 53% met groups biweekly. Substantial proportions of the respondents scheduled individuals (29%) and groups (33%) once a week only. Of the remainder, most used a more intensive schedule, though a few apparently did not even see children on a weekly basis. Considerable dissatisfaction about schedules was expressed: "Approximately one out of two clinicians feels that the number of therapy meetings scheduled weekly is not satisfactory." (12, p. 39)

The actual number of therapy periods provided throughout the school year varies also. The amount of time allocated for speech screening, diagnosis, and scheduling at the beginning of the year varies from two to six weeks. In schools where classes change in mid-year, an additional week or two may be required for reorganizing schedules. Therapy may be discontinued before the end of the school year so that clinicians have time for preparing final reports.

Other reasons exist for the inability to predict total number of therapy periods. While substitute teachers are employed to replace classroom teachers on sick leave, the school clinician has no such counterpart; thus, when he is on sick leave, therapy is cancelled. Therapy sessions are sometimes cancelled in order for the clinician to confer with parents, attend staffings or professional meetings, and, in some instances, to act as substitute teachers.

Therapy approaches are also diverse. Some clinicians use a direct teaching method and emphasize specific skills; others use an indirect approach aimed at stimulating group interaction. Group activities may be structured or unstructured. Activities may be specific for individuals within a group, or all children may be expected to participate in the same activities. Emphasis on auditory training and sound discrimination, mirror work and tongue exercises, isolated sounds as opposed to linguistic units, and receptive as opposed to expressive speech and language differs from clinician to clinician.

Ancillary services and assistance also affect the outcome of therapy. Some clinicians are located in schools where assistance from school physicians, psychologists, counselors, nurses, and social workers is readily available; others have only limited access to this kind of assistance. Sommers (77) has shown that parents can be used effectively to increase the amount of improvement resulting from therapy.

Some clinicians confer with parents routinely and enlist their active participation in the therapy process; others have only minimal contacts with parents. In addition to whatever assistance may be given by parents, classroom instruction must be accounted for. Some children have had speech improvement lessons as a part of regular classroom instruction either prior to or concurrently with therapy. Others have not received this kind of instruction. Speech-improvement activities may augment therapy results, though it is possible they may not. At any rate, consultative services, the amount of parental assistance, and additional instruction such as speech improvement in the classroom qualify treatment given.

Size of caseloads is another important consideration. The Bingham (12, p. 36) survey indicated that the mean caseload was approximately 130 children with mean caseloads by geographic areas ranging from 89.13 to 186.10 children. The caseload study conducted in California (19, p. 7) showed the median caseload to be in the interval of 150-199 children. Caseloads of 19% of the respondents were from 200 to 299, while 5% reported caseloads of 300 to over 400. Beginning with the 1964-65 school year, maximum caseload was mandated at 90. A survey would have to consider not just current caseload specifications, but the limits, or lack thereof, that have applied in the past. That is, treated populations are not strictly comparable on the basis of current caseload specification, since previous caseload limits may dictate the residual population of children needing service.

The foregoing discussion illustrates the variety of approaches to articulation therapy and the multiplicity of variables that affect it. In theory, a survey would produce results based on an "average" program. Nonetheless, in some cases, perhaps in many cases, widely spaced schedules, short therapy periods, large group size, and high caseloads may interact to produce results that are tantamount to no treatment. If these conditions obtain in a substantial number of programs, a survey is as likely to produce no difference between treated and untreated populations as it is to produce a difference. The data might indicate that treatment is not effective. But such a result would not preclude the question of whether therapy per se is ineffective or whether therapy is ineffective under certain circumstances of scheduling, case selection, and so forth. The survey technique is too gross to permit answers to such questions, and the issue of treatment would remain unresolved.

Other Sampling Problems

Even if the above considerations did not present obstacles, still other problems, which are not easily solved, exist for a survey. In order to avoid a biased sample, it would be necessary to make certain that all of the variables that bear importantly upon treatment effectiveness are either represented in the sample or have equal opportunity of appearing on the basis of random sampling. In order to obtain either an adequate representative or random sample for such a survey, total cooperation of school systems is necessary. This kind of cooperation cannot be assumed. The best that could be achieved is a sample of those school systems that are willing to participate. Cooperation for this type of investigation may actually be a critical criterion of the quality of the program; hence, the sample would be biased.

Summary and Conclusions

A survey approach was examined as a means of answering these two questions: a) "How many of the communication problems would be eliminated simply because children grow older and become more mature?"

and b) "What is the difference, if any, in the number of such children coming from systems with speech and hearing programs as contrasted with the number of children coming from systems without such programs?"

The limitations of a survey are the following:

1. The assumption of random samples from the same parent population prior to treatment cannot be met.

2. The school environment of treated and untreated populations would not be the same; thus, real differences due to treatment might be obscured, or differences might obtain that are not due to treatment per se.

3. In the course of time, the concentration of speech deviations, particularly extreme deviations, may shift so that the loss of children from untreated to treated populations gives the former a spuriously low and the latter a spuriously high percentage of speech deviations.

4. Treated and untreated populations are both contaminated. Populations ostensibly untreated contain children who have received therapy from other sources. Treated populations contain children who need, but have not received, therapy. Identification of the speech-service background of each child in the sample would not only be unreliable, but impractical.

5. The lack of uniform practices in critical aspects of therapy programs precludes any reasonable specification of that which constitutes treatment. Consequently, neither rejection or retention of the null hypothesis of the difference between treated and untreated groups would be very meaningful.

6. The chances of drawing either an adequate representative sample or a true random sample are minimal.

These limitations lead to the conclusion that a survey could not produce unequivocal answers to the questions posed.

D. An Experimental Approach

The controls necessary for obtaining unequivocal answers to questions about the need for therapy are available in only the experimental approach to research. Therefore, a research design was developed that would compare the articulatory skills of children with "functional" articulatory deviations who do and do not receive therapy in a population whose progress could be charted over a three-year period from the time they enter kindergarten to the time they enter third grade. The research design included the following provisions:

1. Treated groups and untreated control groups would be random samples from the same parent population prior to treatment.

2. Treated and untreated groups would remain in the same school environment during the course of the investigation.

3. Important factors pertaining to treatment effectiveness would be controlled: type of therapy, frequency of therapy sessions, number of therapy sessions, period of time covered by therapy, group size, age or grade level at the time therapy begins, criteria for assignment to therapy, criteria for dismissal from therapy, caseload of clinicians, dissemination of information to parents and teachers, and treatment from other agencies.

4. The artifacts of a treatment situation (Hawthorne effect) would be controlled.

The requirements for a longitudinal study and experimental controls in research presumed to determine therapy effectiveness led to the development of a study of the effects of schedules and grade level at initiation of therapy on the remission of articulatory errors. The experimental approach developed along these lines of inquiry has other advantages when compared with a survey. It would produce information about a) the effects of therapy initiated in kindergarten and first and second grades, b) the effects of therapy schedules four times weekly as opposed to twice weekly, and c) the relative effects of grade level when therapy is begun and frequency of schedules for moderate and severe problems. These data would provide a much-needed baseline for judging the effectiveness of other variations of schedules and methods of treatment.

METHOD

Subjects

The subjects would be 724 kindergarten children drawn from the second and fourth quartiles of a population of children with consistent "functional" articulatory deviations.

These children would be enrolled in three to five school districts, or special education districts, large enough to produce a total population of 30,000 kindergarten children. Criteria for selecting districts would include a) location in areas using general American dialect, b) location in areas with a stable population, c) low percentage of children transferred from public to parochial schools after kindergarten, d) an established speech therapy program under direct supervision of speech and hearing clinicians. When possible, preference would be given to school districts in which parental permission is not required for enrolling children in speech therapy, and emphasis is placed on therapy for older children rather than for younger children. Finally, schools located in communities with a minimum of speech and hearing service available from nonschool agencies would be desirable.

All kindergarten children in the participating districts would be screened for articulatory errors. The initial screening would be based on a test for 24 consonants and 2 allophones. These sounds would be tested as singles rather than in blends. Two trials would be given for each sound in initial, "medial," and final positions as appropriate. Stimulus material would include the appropriate items from the Templin-Darley Tests of Articulation and additional items of similar vocabulary difficulty required to provide the desired number of trials. The stimuli would be presented orally; children would be asked to respond on a repeat-after-me basis. Children making errors on more than two of the 26 sounds would qualify for further testing.

Children with obvious organic involvement, hearing loss, mental retardation, and bilingualism would be screened out of the group of children making articulatory errors as specified above. Elimination because of organic involvement such as cleft palate and cerebral palsy would be based on the clinical judgment of the examiners. Information about languages spoken in the home would be obtained from enrollment records. Children from homes where more than one language is spoken would be eliminated.

Children not eliminated because of organic involvement or a bilingual background would be given an individual hearing screening test by pure-tone audiometry. The test would include 500, 1000, 2000, and 4000 Hz delivered at 25 dB (ISO). Threshold tests would be administered to those children who fail the screening test. Children whose hearing loss meets medical referral criteria would be eliminated.

Candidates not otherwise eliminated would be given the Peabody Picture Vocabulary Test. Children with IQ scores below 80 would be eliminated on the basis of potential learning disability, even though scores from this test represent vocabulary recognition.

The remaining population of children with articulatory errors would then be tested for consistency with a short form of the Deep Test of Articulation. To be counted as an error, a sound would have to be incorrect in at least five of the 16 contexts used. Only those children who consistently misarticulate three or more of the 26 test sounds would remain in the population from which the experimental population would be drawn.

Subjects meeting the criteria described above would constitute a single population, regardless of school or school district, which would be ranked on the basis of number of articulation errors. The second and fourth quartiles of this population would constitute the experimental population.

Experimental Groups

Three groups of children would receive therapy. One group would begin speech therapy in kindergarten. Therapy would be postponed for a second group until they start first grade. A third group would not receive therapy until they reached second grade.

Three other groups would receive special-attention treatment, but no speech therapy. (The term special attention was deemed preferable to placebo. The purpose in establishing these groups would be to control the Hawthorne effect.) The same pattern would be followed; that is, one group would be scheduled for special attention while in kindergarten; another group would start receiving this kind of treatment in first grade, while a third group would not be scheduled until second grade. In addition to the groups receiving therapy or special attention, two groups would receive therapy preceded by special attention as follows. One group would receive special attention while in kindergarten and begin therapy in first grade, while another group would receive special attention in kindergarten and first grade, followed by therapy in second grade. Thus, a total of five groups would receive special attention only, or special attention subsequently followed by therapy.

Each of these eight groups would have an equal number of children with moderate articulatory deviations (second quartile) and severe articulatory deviations (fourth quartile). Within each of these groups, half of the children would be scheduled for treatment (therapy or special attention) twice weekly, and half would be scheduled four times weekly.

The untreated control group would be constituted in a similar manner. Half would be drawn from the group of children designated as having moderate articulatory deviations; half would have severe deviations.

The number of children required for each of the subgroups, based on attrition rate of approximately 10%, is shown in Table 6 below.

Assignment of Subjects to Groups

The school situation imposes some restrictions on random assignment of subjects to subgroups, since children must necessarily remain in the schools in which they are enrolled. Therefore, once the experimental population has been selected and the school placement of each child in the population identified, the potential number of groups of children in each of the two quartiles that each school could accommodate would be determined. Treatment groups could then be randomly assigned to schools. The breakdown of the 208 groups according to extent of deviation (quartile), type of treatment, and schedule is shown in Table 7.

The children in each school would then be assigned at random to the treatment groups designated for the school. Those not assigned to a treatment group would automatically be assigned to the untreated control group. All children who qualify would be included. The number of children in excess of the 724 specified would be designated as alternates and assigned a rank order. Whenever attrition occurs in subgroups that had not begun therapy or special-attention treatment, an alternate would be assigned to fill the vacancy.

When two or more subgroups of the same category are assigned to the same school, grouping will be left to the discretion of the clinician. For example, if two groups of children with severe articulatory deviations are assigned a biweekly schedule for therapy, the clinician may arbitrarily determine the grouping of the children. Children in the second and fourth quartiles would, however, be scheduled separately.

Assignment of Clinicians to Treatment Groups and Schools

Clinicians would be assigned at random to either therapy or special-attention treatment exclusively. They would also be assigned to a particular schedule frequency. Insofar as possible, they would be assigned to the schools they ordinarily serve. Assignments to other schools, which would be necessary in some cases, would take geographic location into account in order to minimize additional travel time.

Desirably, clinicians would be assigned to a specific schedule for a particular type of treatment for children with a given level of articulatory deviation. This procedure would mean that eight different clinicians might be assigned to one school in the event that any one school might have drawn the total possible number of treatment groups. In order to avoid the confusion that might result as well as the inefficiency of the extensive travel that would be required, the compromise of permitting the clinician to treat children in either of the two quartiles seemed preferable.

Table 6. Grade level, weekly schedule, and number of subjects for therapy and control groups.

	Kindergarten		Grade 1		Grade 2		
Type of Group	2	4	2	4	2	4	Totals
Therapy							
2nd Quartile	21	21	21	21	21	21	126
4th Quartile	21	21	21	21	21	21	126
Special Attention							
2nd Quartile	21	21	18	18	18	18	114
4th Quartile	21	21	18	18	18	18	114
Special Attention (Therapy in Grade 1)							
2nd Quartile	18	18					36
4th Quartile	18	18					36
Special Attention (Therapy in Grade 2)							
2nd Quartile	18	18					36
4th Quartile	18	18					36
Untreated							
2nd Quartile	50						50
4th Quartile	50						50
					TOTAL		724

Table 7. Number of groups by quartiles, type of treatment, and weekly schedule.

Type of Group	Number of Groups Twice Weekly	 Four Times Weekly	Totals
2nd Quartile			
Therapy - Kdg.	7	7	14
Therapy - Grade 1	7	7	14
Therapy - Grade 2	7	7	14
Special Attention - Kdg.	7	7	14
Special Attention - Grade 1	6	6	12
Special Attention - Grade 2	6	6	12
Special Attention - Kdg. Therapy Grade 1	6	6	12
Special Attention - Kdg. and Grade 1, Therapy Grade 2	6	6	12
Total Groups			104
4th Quartile			
Therapy - Kdg.	7	7	14
Therapy - Grade 1	7	7	14
Therapy - Grade 2	7	7	14
Special Attention - Kdg.	7	7	14
Special Attention - Grade 1	6	6	12
Special Attention - Grade 2	6	6	12
Special Attention - Kdg. Therapy Grade 1	6	6	12
Special Attention - Kdg. and Grade 1, Therapy Grade 2	6	6	12
Total Groups			104

Treatment

Therapy and special-attention groups would be composed of three children, but could vary from two to four in order to adjust for attrition. Periods would be 30 minutes in length; schedules would be based on 40-minute units to allow time for movement of children to and from classrooms. As mentioned above, two different weekly schedules would be used--twice and four times weekly. Therapy and special attention would extend over a 7-month period. Once begun, treatment or special attention would continue until all sound errors are corrected or until the project is completed.

The type of therapy provided would be controlled by selecting clinicians whose therapy procedures generally conform to the broad description that follows.

Therapy would be direct, systematic, and clinical. In this respect, clinical is taken to mean that each child's activities in the group situation would be selected according to his needs as opposed to all children's engaging in the same activity. The approach used in teaching sounds would be highly structured and proceed from isolation, to nonsense syllables, to words, to phrases and sentences, and then to spontaneous "carryover." "Ear training" would be used in conjunction with production. Both phonetic placement and the method of approximation would be used in teaching correct sound production.

Less direct procedures would be used for those kindergarten children whose speech is so poorly developed that training in articulatory skills is inappropriate. In some cases, the first therapeutic task would be to encourage more extensive verbal output and vocabulary development. In other cases, the first step would be to establish better general approximations of meaningful units within the existing speech patterns before working on specific sounds.

Special-attention groups would be told they are attending speech class, but the activities during the sessions for these groups would be directed toward generating group conversation and interaction. No attention would be directed to the children's speech as such. Activities would include share-and-tell, story telling, discussions about home and school activities, pets, vacations, and so forth. Detailed daily lesson plans would be developed for the clinicians conducting special-attention groups in order to minimize clinicians' inadvertently engaging in therapy. The following restrictions would be invoked: a) The children's speech is to be left alone. b) Neither speech sounds nor better pronunciation is to be taught. c) Stress on a particular vocabulary and the teaching of a new vocabulary are to be avoided. d) Verbal output of the adult is to be minimal, while normal conversation of the children is to be emphasized. e) No reinforcement for better speech-sound production or pronunciation is to be given.

At such time as the clinician believes a child has corrected his articulatory errors, the child would be referred for testing. The original screening test would be administered, and spontaneous speech would be observed. If errors are found, the Deep Test of Articulation would be administered. More than two errors in 16 contexts would be the criterion for an uncorrected sound. If errors are present, the child would be returned to his treatment group. If no errors are found as defined above, a recorded sample of spontaneous speech would be obtained at the time of dismissal from the treatment group. A follow-up test would be administered at the end of four weeks following termination. If a stable result has been achieved, the child would be dismissed permanently. If errors are found, the child would be returned to his treatment group.

Classroom teachers would be given routine reports on children's progress. Specific suggestions for individual children would not be given unless the suggestions are actively solicited. Actively engaging teacher assistance would be avoided, and clinician-teacher interaction would be kept to a minimum.

Parent conferences would be limited to three each year. One conference would occur at the beginning of the year, another at mid-year, and one at the end of the year. Parents would be encouraged to accept the child's speech as it is. They would not be provided with specific suggestions for assisting children.

Professional Personnel Requirements

Personnel for Testing. Approximately 37 clinicians would be required to conduct speech tests during a three-week period at the beginning of the school year. The initial screening would require an estimated average of three minutes per child or a total of 1,500 hours for 30,000 children. Approximately 9,000 children would need additional speech tests estimated to require 1,800 hours. The 3,300 hours of testing time could be accomplished by 37 clinicians in three weeks allowing 30 hours of testing time per week due to kindergarten schedules. Two clinicians would be required for making tape recordings of spontaneous speech during a one-week period immediately after the experimental group has been identified.

Since approximately 12,000 of the original 30,000 children would need to take the Peabody Picture Vocabulary Test, which requires an estimated 12 minutes for kindergarten children, 27 examiners would be needed to complete the test in a three-week period. These examiners would be drawn from the school districts' panels of substitute teachers.

About 12,000 children would require hearing tests. Two audiometrists would be required for screening; an additional two audiometrists would be needed for threshold tests.

Post-tests would be administered to all of the children in the study population, regardless of the group to which they are assigned. Based on an estimate of 12 minutes for the speech examination and three minutes for the tape recording, approximately 188 hours of testing time would be needed. Seven clinicians could complete the tests in a one-week period. These tests would be repeated at the beginning of each school year; that is, at the time this group of children enters first, second, and third grades. One clinician would need to be available during the school year to test children who are to be dismissed from the treatment groups. Personnel for the post-tests would be recruited from among the clinicians participating in the initial testing program but who have not participated in the treatment program.

Estimated personnel needs for screening and testing at the beginning of the project are as follows: a) speech screening and testing, 37 clinicians for 3 weeks; b) recording spontaneous speech, 2 clinicians for 1 week; c) hearing tests, 4 audiometrists for 3 weeks; d) administering the Peabody Picture Vocabulary Test, 27 substitute teachers for 3 weeks. At the end of the school year, 7 clinicians would be needed for administering post-tests, and 1 clinician would need to be available for testing throughout the year.

Treatment Personnel. Clinicians already working in the participating districts would be employed by the project. They would be selected on the basis of the recommendation of the local school administration. Preference would be given for those who meet the following criteria: a) ASHA Certificate of Clinical Competence in Speech Pathology, b) recommended for superior ability as a clinician, c) tenure in the district, d) three years of public-school experience, e) therapy orientation compatible with that outlined above. These clinicians would be employed on a part-time basis and would maintain regular therapy assignments during that portion of their time not assigned to the study.

Clinician time required for treatment groups during the first year of the project amounts to 208 hours weekly, as shown in Table 8. Fourteen half-time clinicians would be needed. During the second year of the study, the amount of clinician time needed on a weekly basis would be 266 hours. The basis for this estimate is shown in Table 9. Approximately 17 half-time clinicians would be required. Weekly treatment time required during the third year, which is shown in Table 10, is 286 hours. Approximately 19 half-time clinicians would be needed.

Supervisorial Personnel. Part-time supervisors, either the regular supervisor for the district or a clinician designated by the district, would be employed to supervise the clinicians working with the project. The Project Director would work directly with the supervisors. The supervisors would be responsible for programming the screening and testing aspects of the project and for working out the details of physical facilities and schedules.

Table 8. Estimated clinician time required for treatment groups on a weekly basis during the first year of the study.

Type of Treatment	Twice Weekly Number of Groups	 Number of Minutes	Four Times Weekly Number of Groups	 Number of Minutes
Therapy	14	1120	14	2240
Special Attention	14	1120	14	2240
Special Attention (to receive therapy in grade 1)	12	960	12	1920
Special Attention (to receive therapy in grade 2)	12	960	12	1920
TOTALS	52	4160	52	8320

Total Groups = 104
Total Children = 312
Total Time = 12480 minutes or 208 hours per week

Table 9. Estimated clinician time required for treatment groups during the second year of the study.

Type of Treatment	Twice Weekly Number of Groups	Twice Weekly Number of Minutes	Four Times Weekly Number of Groups	Four Times Weekly Number of Minutes
Groups Continuing from Kindergarten				
Therapy	6	480	5	800
Special Attention	13	1040	13	2080
Therapy--Grade 1 (received special attention in Kdg.)	11	880	11	1760
Special Attention (to receive therapy in grade 2)	11	880	11	1760
New Groups Beginning in Grade 1				
Therapy	14	1120	14	2240
Special Attention	12	960	12	1920
TOTALS	67	5360	66	10560

Total Groups = 133
Total Children = 399
Total Time = 15920 minutes or 266 hours per week

Table 10. Estimated clinician time required for treatment groups during the third year of the study.

Type of Treatment	Twice Weekly Number of Groups	Twice Weekly Number of Minutes	Four Times Weekly Number of Groups	Four Times Weekly Number of Minutes
Groups Continuing from Kindergarten				
Therapy	2	160	1	160
Special Attention	12	960	12	1920
Therapy--Grade 1 (received special attention in Kdg.)	7	560	4	640
Therapy--Grade 2 (received special attention in Kdg., grade 1)	11	880	11	1760
Groups Continuing from Grade 1				
Therapy	7	560	4	640
Special Attention	11	880	11	1760
New Groups Beginning in Grade 2				
Therapy	14	1120	14	2240
Special Attention	12	960	12	1920
TOTALS	76	6080	69	11040

Total Groups = 145
Total Children = 435
Total Time = 17120 minutes or 286 hours per week

Listeners for Rating Defectiveness of Recorded Speech Samples. Experienced school clinicians would be used to constitute the panel of listeners for rating samples of recorded speech for defectiveness. Panel size would be set at nine, and a seven-point, equal-appearing-intervals scale would be used. These listeners would not be needed until the end of the project.

Orientation Sessions

Clinicians selected to conduct speech screening and tests for identifying the experimental population would be scheduled for a four-day orientation session. Following thorough briefing about test materials and schedules, clinician agreement and reliability would be established.

The substitute teachers employed to administer the Peabody Picture Vocabulary Test would meet in a one-day orientation session.

Clinicians assigned to therapy and those assigned to the special-attention treatment would meet as separate groups for orientation. The therapy orientation would be reviewed during a one-day session. The purpose of the special-attention groups and a review of the lesson plans would be accomplished in a two-day session for the clinicians assigned to that aspect of the program.

Supervisors would attend all orientation sessions. The Project Director would meet with supervisors individually prior to the orientation sessions. A one-day group meeting of the supervisors would be scheduled following the orientation sessions for resolving whatever problems arise from or are anticipated as a result of these meetings.

Clinicians responsible for obtaining recorded speech samples would record a minimum of five samples of speech from kindergarten children who are not in the experimental population. Samples would be reviewed by the supervisor to make certain adequate 10-second samples are obtained.

Data Reduction

Two criterion measures would be used. The primary criterion measure would be the number of correct test items based on the test of 24 consonant phonemes and two allophones. To be counted as an error, the sound would have to be misarticulated in five out of 16 contexts from the Deep Test of Articulation. Ratings of defectiveness of recorded 10-second samples of spontaneous speech would serve as a second criterion measure. Since recordings are not particularly sensitive to some sound distortions and since the visual aspects of speech production do not affect these judgments, this criterion measure would provide supplementary rather than primary information.

Therapy, special-attention treatment, and untreated control groups would be compared at the end of each year of the study. Tests made at the beginning of the school year when the children enter third grade would allow further comparison between groups to determine the stability of results or whatever additional gains may have been made during the intervening summer months between the completion of second grade and the beginning of third grade.

Groups would also be compared on the basis of the number of children dismissed from the treatment groups according to the length of time they received treatment.

Mean age, sex ratio, and mean socioeconomic level would be computed for children comprising the second and fourth quartiles of the distribution of children with articulatory deviations. The relationships of these variables to improvement in articulation skills and rated severity would also be determined.

Data collected during screening would provide prevalence figures for articulatory deviations in the age group represented by kindergarten children.

Participating School Districts

Signed agreements were secured from administrators of three school districts indicating an interest in participating in the research program outlined above. These districts are Montgomery County (Pennsylvania) Schools, the St. Louis (Missouri) Special Education District, and the Rio Linda (California) Unified School District. A fourth statement of interest in participating in the study came from the Los Angeles County Superintendent of Schools Office.

Estimated Budget

Budget estimates were based on a period covering three-and-half years. The adjustments necessary to accommodate the school year dictate that fiscal year for such a project should be from August 1 to July 31. The research is designed to cover three school years, with follow-up tests during the beginning of the fourth year. Thus, an additional half-year would be required to complete data collection and preparation of a final report.

Estimated budget requirements are as follows:

First Year

Testing and Treatment Personnel	$ 109000.00	
Supplies and Equipment	7000.00	
Orientation Sessions	8500.00	
Project Administration (including data processing, consultant fees, travel, etc.)	50000.00	$ 174500.00

Second Year

Testing and Treatment Personnel	$ 93000.00	
Supplies and Equipment	2500.00	
Orientation Sessions	5000.00	
Project Administration	46000.00	
		$ 146500.00

Third Year

Testing and Treatment Personnel	$100000.00	
Supplies and Equipment	2000.00	
Orientation	5000.00	
Project Administration	46000.00	
		$ 153000.00

Follow-up

Testing Personnel	$ 1200.00	
Orientation	1000.00	
Project Administration	25000.00	
		$ 27200.00
	TOTAL DIRECT COST	$ 503200.00

DISCUSSION

In comparison with a survey, an experimental study has many advantages. It is, nonetheless, beset by a number of vexing problems. The experience of developing the research plan for assessing the effects of schedules and grade level at the time therapy is begun brought these problems into focus. Some of them were discussed at a conference on research for public-school speech and hearing personnel sponsored by the American Speech and Hearing Association and the U. S. Office of Education. (See Rees, 67) This same set of problems will obtain for other studies involving questions about the effectiveness or efficiency of therapy in schools. Certain restrictions that are indigenous to the school environment pose a number of obstacles to rigorously controlled research; nevertheless, many vital questions can be answered only by research conducted in schools. These problems are reviewed in the discussion that follows.

Clinician Agreement and Reliability

One of the difficulties of research in speech pathology is that speech skills must be evaluated subjectively. Audiometers, which can be calibrated, make the measurement of hearing sensitivity reasonably objective. Similar instruments for objective measurement of speech skills are not available. It is necessary to rely on clinicians' ears, for which an easy method of "calibration" has not been devised.

Some time must be spent before beginning a research project to establish clinician agreement and reliability. If levels of agreement are unsatisfactory, participating clinicians must be trained to meet an appropriate criterion. Recorded training materials usually have to be developed for each project, since standard test procedures and materials have not been uniformly adopted. Information is lost in the inevitable distortions of tape recordings of films and kinescopes. Judgments based on recorded speech samples are only approximations of judgments made in the actual test situation where a number of other cues operate that undoubtedly qualify judgments.

The alternative of judging speech skills from recorded speech samples is impractical in the school situation if a large number of subjects is to be used. The physical setting is not satisfactory for recordings of high quality, and portable recording equipment lacks fidelity. The operations involved in preparing recorded samples for a panel of listeners are tedious and time consuming and, therefore, expensive.

The lack of a simple, direct means of objectively measuring speech and the cumbersome procedures required for such objectivity as can be derived from scaling recorded speech samples are among the major reasons why school clinicians have produced so little research. Quality control over case selection in schools suffers for the same reasons.

Establishing Experimental Populations

In research involving extended instruction, the study population must be established rather quickly; otherwise, the amount of time remaining in the school year during which therapy can be scheduled is curtailed. The lag-time between examination and the onset of therapy should be both minimal and constant from subject to subject. The same need for limiting the time allocated to testing sometimes arises even when treatment is not a variable under study. In some kinds of studies, learning environment needs to be controlled, since it may affect speech behavior. Therefore, the test period should be short so that the amount of school experience remains constant for the subjects.

Large teams are needed for screening and testing in a limited amount of time. As the number of clinicians increases, agreement and reliability usually decrease. Recruiting a large staff is usually a problem. Experienced clinicians are rarely available for temporary work. Using the district's entire staff for the purpose of identifying a study population is usually untenable, since routine assignments would have to be set aside.

Importing teams of testers from outside the school is not a good solution. In the first place, such teams do not exist. In the second place, schools are understandably resistive to admitting personnel who are not directly responsible to them by virtue of employment contracts.

Attrition

Attrition of the subject population due to mobility is a serious problem in any longitudinal study conducted in schools. The problem is exacerbated if the study encompasses several years. Particularly in a study involving kindergarten children, a number of subjects would be lost, since many children are placed in public schools for kindergarten and are transferred to parochial schools when they are ready for first grade. Some children remain in public schools for as long as they need special services and are transferred to parochial schools when parents deem the need for special services has diminished. These subjects, too, might be lost before the study has run its course. The public-school situation is not one in which subjects can be easily eliminated on the basis of likelihood of eventual enrollment in parochial schools.

Some subjects would be eliminated in the course of time because parents enroll them with other agencies for additional therapy. Subjects most likely to be eliminated for this reason are those assigned to untreated control groups.

The usual attrition rate in participating schools may be of some help in determining the number of subjects needed at the outset of a longitudinal study, but it does not solve the entire problem.

Statistical analyses that maximize precision and allow tests for interaction effects require equal or proportional cell frequencies. Where several variables are under study, a large number of cells are involved. For example, in the research plan previously described, part of the data could be analyzed in a four-factor design involving two levels of severity, two types of treatment (therapy and special attention), three grade levels, and two schedules. Such a design would have 24 cells. The attrition rate predicted on the basis of the rate established for the school would not be equally distributed over all cells. By chance, one or more cells could be virtually eliminated, while others might not be affected at all. At best, a less precise analysis would have to be used and interactions could not be tested; at worst, some of the desired comparisons among major variables could not be made.

The need to take attrition in the experimental groups into account means beginning with a population much larger than is necessary for the comparisons intended at the end of the study. The inefficiency of this expedient adds to the cost of the research. The average per capita cost for subjects for whom complete data are available at the close of the study would be very high.

Attrition among clinicians in a longitudinal study should not be overlooked. Turnover in clinic staffs is quite high in many schools. Additional orientation and training sessions for new clinicians who must be absorbed into the project add to necessary expenditures. The chances that unwanted variation in procedure will be introduced increase. Turnover in staff does have the advantage of expanding the sample of clinicians.

Random Assignment of Subjects to Experimental Groups

True random assignment of subjects to experimental groups is impossible in research involving several schools. Children must remain in the schools they would normally attend. Arbitrarily transferring children to other schools to produce concentrations of children with speech deviations would not only meet with parental resistance, but would create distortions in the school situation such that normal conditions would no longer obtain. Results of the experiment would not represent those that might be expected under ordinary conditions for school therapy programs; therefore, the research would have little value.

Individual schools will produce only a few subjects, so it is necessary to derive an experimental population from a large number of schools in order to have a representative group. The concentration of children with speech deviations varies among schools within a district. This fact, coupled with the small number of subjects that can be found in individual schools, means that the entire experimental program could not be conducted in a single school with a series of replications in other schools. The most reasonable compromise appears to be random assignment of treatment categories to schools and then to assign subjects at random to the treatment categories designated for the school.

A large number of schools, as well as a large number of treatment groups, are required to insure a sampling of learning environments so that a particular treatment category is not confounded with one or two schools. When only a few treatment groups can be expected in each school, as would be the case for research using children from a single grade level, a good deal of the clinicians' time would be used in traveling between schools. This situation would be inefficient, but it is unavoidable.

Assignment of Clinicians to Experimental Groups

In well-controlled research, a clinician would be restricted to a single treatment category. In the research design previously described, a clinician would be assigned to one type of treatment and one schedule for children with either moderate or severe disorders, but not both. Clinician bias is likely to obtain if this precaution is not observed. A clinician assigned by chance to several groups of children with moderate problems on a schedule of four times weekly and also to several groups of children with severe problems on a biweekly schedule might unintentionally compensate for what would appear to him to be an inequitable schedule. A similar problem could arise were a clinician to be assigned to a number of therapy groups composed of children with moderate problems scheduled four times weekly and to several special-attention groups composed of children with severe disorders scheduled biweekly.

Rigid experimental controls not only dictate restricting a clinician to a single combination of experimental variables, they also dictate assigning a sample of clinicians to a given treatment category. The effectiveness of therapy is partly a function of the clinician himself, regardless of the method purportedly used. Eventually it may be possible to objectify the multiple components of behavior that affect therapy results; currently much of this behavior has not been specified and, therefore, cannot be controlled. In the absence of controls, the effects of individual clinicians must be randomized. Thus, the number of clinicians assigned to a given treatment category must be large enough that results can be generalized to clinicians.

The need for a substantial sample of clinicians in addition to the restriction of clinicians to a single treatment category creates a dilemma. If clinicians are employed full time for the research, the total number of clinicians would be too small for the desired sample. If clinicians are employed on a part-time basis and carry out their normal school assignments during the remainder of their time, the restriction to a single treatment category in order to control bias would be partly, or perhaps completely, nullified. The advantages and disadvantages of full-time versus part-time employment in a research project must be weighed carefully. Overall, it is probably preferable to use part-time clinicians in order to have a larger sample of clinicians.

The geographical dispersion of schools within a district makes random assignment of clinicians to schools impractical. Through random assignment, a clinician might be required to add as much as an hour to two hours of travel time to his regular day, and morale problems could be anticipated. Research conducted in schools is not likely to be able to incorporate all of the desirable features of good research design and some compromises will be necessary.

The necessity of controlling potential clinician bias introduces another complication in research in schools. Eight different clinicians might be assigned to a single school in a study that has eight treatment categories (two types of treatment, two schedules, two levels of severity). The assignment of multiple clinicians to a single school is unusual and would represent a departure from ordinary practice. The effects of the therapy program might be altered due to relations between faculty and clinic staff resulting from such an unusual situation.

Control of the Effects of the Experimental Situation

Next is the problem of controlling the effects of the special attention that the children in the therapy groups receive. In order to demonstrate clearly that whatever changes occur in the children's articulatory behavior are due to therapy rather than to the therapy situation itself--being taken regularly from the classroom and engaging in activities with two or three other children and an adult--it is necessary to set up control groups that experience the same situation as the therapy groups except that they would not receive therapy.

Several serious difficulties are attendant upon this kind of experimental control. First is the problem of personnel to provide this special-attention (placebo) treatment. If a nonclinician provides this treatment, sooner or later it will be evident that this person is not a clinician. The teacher will know that the children are not receiving therapy, which would vitiate, in part, the purpose of the special-attention treatment. Once teachers learn that the children are not actually receiving therapy, parents would soon find out about it. Relations between school and parents are likely to become strained. Not many, if any, parents would be willing to have children miss an hour to two hours weekly from class to receive "speech therapy" from someone who is not a speech clinician, nor are teachers likely to go along with it. Teachers are understandably resistive to children's missing classroom instruction. The teacher's ability is usually judged by the academic achievement of his pupils. Absence from class interferes with the child's academic progress and, thus, constitutes a threat to the teacher.

The problems are not entirely resolved by assigning clinicians to give this form of treatment. Most clinicians would have trouble switching from therapy to no therapy in the event of assignment to special-attention groups. Were a clinician to spend full time with these groups, he would probably feel that he was not making appropriate professional growth. More importantly, he would be apt to feel that his clinical competence and professional reputation were being placed in jeopardy, since he would expect little, if any, change in the children's speech.

Sixteen clinicians were asked whether they would be willing to assume such an assignment were they asked to do so. Even though they understood the purpose of this kind of control treatment, each said he would not be willing to use either his time or the children's time in this fashion. It seems, then, that it would be hard to find clinicians who would be willing to participate in this aspect of a research program. Research extending over several years would pose special problems in this respect.

Other consequences to this kind of experimental control can be predicted in the school situation. Assuming that this treatment has relatively little effect, a large number of children receiving "therapy" but not benefiting from it would be prejudicial to the therapy program generally. If the children in the special-attention groups came from the same classrooms as the children receiving therapy, the overall value of therapy is likely to be questioned on the basis that a considerable number of children do not profit from it. If special-attention treatment were given by one clinician and therapy by another, teachers would soon be critical of the clinician whose work was not producing results. An essential part of this form of control is, of course, that everyone except the person administering it must believe that it is regular therapy. School administrators would soon begin to receive complaints from parents and teachers.

Attrition would also be high in these groups. Enterprising parents would find other sources of help for their children, particularly those children with the most severe disorders.

Using control groups from schools that have not had therapy programs is untenable, since type of treatment would be confounded with schools. Severe criticism of the value of therapy would be another hazard under these circumstances. If the school has not had therapy previously, it would prejudice the possibilities for eventually implementing a therapy program because of inferred lack of effectiveness.

The importance of controlling the Hawthorne effect is open to some question. The Hawthorne effect, to whatever extent it exists as far as therapy is concerned, will always operate in the regular school situation, since therapy is conducted by removing children from classrooms. The attention that a child receives in a small group of peers directed by an adult is indigenous to therapy. Whether the situation itself has a measurable effect is of more theoretical than practical interest.

Perhaps the only practical aspect of this type of treatment control lies in its potential implications for the use of subprofessionals. Should the children receiving this type of treatment make greater progress than those not receiving treatment, subprofessionals might be used in the absence of sufficient professional staff. However, that would be tantamount to recommending inferior service. Should the groups receiving this type of treatment prior to enrollment in therapy make greater progress than children of equivalent grade level who are enrolled in therapy for the first time, the services of subprofessionals might be used to augment the services of professional personnel.

In order to draw conclusions about the use of subprofessionals, nonclinicians would have to administer this kind of treatment in the research. The problems anticipated from using nonprofessional personnel have already been discussed.

Another outcome is possible; namely, the progress of children in special-attention groups might be equal to or better than that of children receiving therapy. Existing knowledge about instructional procedures and learning, coupled with informal evidence based on clinical observation accumulated over many years, makes this result improbable. Such a tenuous hypothesis scarcely warrants the expense of a major research effort until some small-scale investigation lends it more support than is currently available on a priori grounds.

Untreated Control Groups

Perhaps the most critical problem for research conducted in schools is that of maintaining untreated control groups. The untreated control group is the sine qua non of an experiment designed to determine the difference between the effects of vicarious learning and formalized instruction (therapy). Untreated groups are essential also for methods studies and research involving other questions of importance to school programs.

Failure to provide service to children in schools having a legal mandate to do so could result in litigation. In situations where there are too few clinicians to give service to all children with speech deviations, the untreated controls with mild deviations might be managed easily enough under the guise of placing them on a waiting list until they could be included in the treatment program. Not so with the untreated controls with severe deviations. Teachers and parents alike would begin to question the criteria for case selection. A few parents might be sufficiently uninterested to be willing to allow children to forego therapy, but that would be no more than a fortuitous circumstance. Children cannot be assigned to untreated control groups on the basis of parental attitude. An untreated control group does not serve its purpose unless it is randomly selected from the same population from which the treated groups are also drawn. These children must also be maintained in the same learning environment as children receiving therapy, which means they should be from the same classrooms.

Parents of some of the children in untreated control groups will exert considerable pressure in attempting to obtain service for their children. The most energetic in this respect are not necessarily the parents of the children judged by clinicians to have the most severe speech disorders. Schools do not operate in a vacuum. Administrators have to be responsive to public opinion; therefore, it is not surprising that they view a situation likely to place a strain on public relations with distaste. Reactions to variations in instruction in the regular curriculum are quite different from reactions to differential treatment of handicapped children when no service at all is involved. No great problem arises when entire classes within a school or entire schools within a district are taught by different methods. That is, within the same school two third-grade classes might be taught reading by different methods. One class would be taught by a traditional method, and the other by some new method. Parental dissatisfaction would not be anticipated unless the children in the experimental group failed to make progress. In this instance, all children receive reading instruction. It is not a case of some children's being completely denied a service. Furthermore, groups of children rather than individuals have been singled out. Reactions are exaggerated when selection must be made from among children who have speech disorders, or any kind of a difference to which a negative connotation is attached. Of course, some parents are indifferent; others become highly emotional, and relations between parents and schools deteriorate.

The difficulties of maintaining untreated control groups in schools seem nearly unsurmountable. Other work environments in which speech therapy is offered are, perhaps, even more limited as settings for research requiring untreated control groups. The obligation to provide therapy in return for fees paid by parents or from community funds makes withholding therapy impossible. Generally, these settings do not have the advantage of the large heterogeneous populations found in schools, which is another disadvantage for comparisons of this kind.

The public-relations problems that untreated control groups would create might be obviated, at least to a degree, were a research program requiring treated and untreated groups conducted in schools where therapy programs had not previously existed. A small-scale program could be introduced on a trial basis. Thus, service for a relatively small percentage of the children needing it might be satisfactorily justified to the community. Five practical considerations argue against this alternative: a) Most school districts large enough to accommodate a study of any magnitude already have therapy programs. b) Introducing a therapy program for the first time has its own set of problems, which would add to staff requirements. c) A professional staff of experienced clinicians would be exceedingly difficult to recruit for positions with no guarantee of tenure. d) The entire professional staff would have to work full time on the research program, which would limit the number of clinicians involved. e) Considerable pressure from some of the parents whose children were not selected could be anticipated.

Summary and Conclusions

An experiment to determine therapy effectiveness has many advantages when compared with a survey. Even so, a great many problems can be anticipated in attempting to conduct an experimental therapy program in schools. The major difficulties are summarized below:

1. The lack of a simple means for measuring speech skills objectively makes research in speech pathology especially cumbersome in the school environment.

2. An adequate staff of experienced clinicians for identifying and testing experimental populations in a short period of time is difficult to recruit.

3. Attrition among subjects, and even among participating clinicians, results in inefficiency.

4. The need for children to remain in their regular schools imposes restrictions on random assignment of subjects to experimental groups.

5. Random assignment of clinicians to treatment groups is probably not possible at all.

6. Restricting clinicians to a single treatment category creates inefficiency, since groups cannot be concentrated in one or two schools. It also means assignment of several clinicians to a single school.

7. Control groups for assessing the Hawthorne effect create staffing dilemmas, as well as professional and public relations problems.

8. Untreated control groups are extraordinarily difficult, perhaps impossible, to maintain in schools.

These considerations do not necessarily preclude conducting a large-scale research program for determining the effectiveness of therapy under reasonable conditions of experimental controls or similar types of studies. They do, however, demonstrate the complexities and potential hazards attendant upon research in schools.

OTHER RESEARCH PROBLEMS

In addition to the question about the number of children who would "outgrow" communication problems and the comparison of the number of children with communication problems found in schools with and without speech and hearing programs, the grant application posed three other questions: a) "Is there a higher incidence of communication problems among high-school dropouts?" b) "Are a large number of children who have significant communication handicaps being graduated from high school?" c) "Basically, are existing programs designed to serve the needs of those children who would be seriously handicapped upon completion of their public-school training if they did not have such help?"

School Dropouts

Attempting to determine the prevalence of communication problems among high-school dropouts from school records is not feasible. Only 6% of the 1,462 clinicians reporting in 1961 (Bingham and others, 12) worked primarily at the high-school level. Thus, very few high schools could be expected to have speech records for their student populations. Many high-school programs are based on referrals only, so complete records on student populations are not necessarily available, even in those schools with speech and hearing programs. Furthermore, the reliability and accuracy of the data in such records as do exist could not be verified. Methods and materials used in screening or testing, as well as the criteria for judging speech deviations, would vary considerably from sample to sample.

The obstacles to locating dropouts and then obtaining cooperation for speech examinations are formidable. Consultation with school administrators confirmed the anticipated difficulty of locating individuals who have severed their relations with the school.

The speech status of dropouts could be determined best by maintaining surveillance over high-school populations through an ongoing program of speech evaluation. The speech status of all students in these populations would need to be established and adequate precautions taken to insure routine testing of all transfer students. When a student dropped out of school, information about his speech status could be added to a slowly accumulating corpus of data.

For greatest efficiency, these data should be gathered by clinicians already serving high schools. Considerable time and expense over and above normal program requirements would be involved in order to maintain accurate and current information regarding the speech status of students in high-school populations where therapy programs are available. For schools without service, it would be necessary to set up speech-testing programs for the express purpose of accumulating this information. These programs would have to be maintained in a large number of schools for a period of several years in order to arrive at a sample of dropouts large enough for results to be conclusive.

Comparisons might be made among three different groups. Some high schools that do not offer speech and hearing services are in districts where therapy is available in elementary schools; others are in districts where this service has never been a part of the school program. High schools offering therapy are usually in districts where therapy is available in elementary schools also. Differences in prevalence figures among these three sets of schools would permit some inferences about the effects of special services. If the therapy history of each student were determined, additional inferences could be made about the consequences of inadequate or ineffective service; that is, a large number of dropouts with speech deviations may not have had therapy or they may have had unsuccessful therapy.

The information that could be obtained from this kind of study would be valuable. Nonetheless, it pertains to a very small proportion of the population of individuals with speech and hearing handicaps and would provide few, if any, implications for improving speech and hearing programs. In view of the number of critical questions of broad scope that need to be answered, research addressed to questions about the communications skills of high-school dropouts must be given a low priority.

Speech Handicaps Among High-School Graduates

A prevalence study would be required to determine the number of high-school graduates who have speech handicaps. Sampling problems could be managed best by testing students in the final semester of their senior year of high school. Students who fail to graduate could be eliminated from the data. In addition to the major purpose of such a study, prevalence of speech disorders among those who successfully complete the final semester could be compared with that for students who failed to graduate. Since a national prevalence study is already in progress, no rationale exists for a prevalence study on such a limited scale.

Relation of Existing Programs to Seriously Handicapped Individuals

The question of whether existing programs are designed to serve the needs of those children who would be seriously handicapped if they did not have assistance with communication problems implies that children may be receiving service who do not need it. The research plan previously described would determine the effectiveness of therapy in kindergarten and first and second grades compared with no treatment. However, answers derived from that research would indicate the learning conditions that facilitate acquisition of correct speech. The present question as it is stated seems to be addressed primarily to the concept of seriously handicapping conditions.

The terms seriously handicapped and significant communication handicap pose difficulties in scientific investigations. Handicap is a relative rather than an absolute term. A condition is handicapping only in relation to some other specific condition or situation. A condition may be a handicap in one situation, but an advantage in another.

Articulatory defectiveness in running speech can be reliably scaled, and the number of defective sounds can be reliably measured--facts established by numerous studies. Several quantitative indices derived from phonetic inventories (number of defective items, number of defective sounds, number of defective sounds measured as singles) as well as ommission-type errors have a strong positive relation to rated defectiveness of running speech (Jordan, 46). Nevertheless, these indices are not statements about consequences. The acoustic characteristics of the speech are not the sole determinants of the seriousness or significance of a speech deviation. Etiology, associated learning disabilities, and the length of time and amount of treatment required to overcome the deviation are important parameters of severity. But even these additional measures do not determine the full extent of the limitations imposed by speech differences.

More realistically, the consequences of a speech deviation are related to an array of characteristics, capabilities, and aspirations of the individual and to his social milieu. For example, a minor degree of residual dyslalia may disqualify an otherwise capable individual from becoming a classroom teacher, a speech pathologist, a telephone operator, or an opera singer; but numerous sound deviations may go virtually unnoticed in an assembly-line worker, a farm laborer, or a janitor. Multiple articulatory deviations in an individual of superior intellectual ability may present obstacles to employment in numerous professions or vocations for which he would otherwise be qualified; a similar degree of deviation in mentally retarded individuals or persons with cerebral palsy probably would not materially alter their employment prospects.

The social impact of speech deviations has received little attention as far as research is concerned. The consequences of speech deviations to individuals in terms of self-concepts and ability to function with other people are obscure. Though some kinds of speech disorders have a definite onset, articulatory disorders are, in a sense, developmental failures; behavior before and after the onset of the disability cannot be measured. Therefore, some of the consequences to certain types of speech deviations are likely to remain nebulous. The extent to which a speech deviation is handicapping cannot be determined with confidence without prior knowledge of the requirements for speech excellence that an individual will be called upon to meet by virtue of his profession or vocation and social milieu in adult life, and without prior knowledge of the assets and other liabilities he will have to offset or augment the effects of a speech deviation.

Good speech is one of a number of attributes of an educated man. Perhaps the more cogent issue is whether all children with speech deviations are being given adequate opportunity to learn correct speech. It is important to consider, also, that the school environment dictates some of the characteristics of school programs. Thus, school therapy programs may be better suited to meet the needs of children with some kinds of speech deviations than with others. Overall effectiveness of programs is perhaps better studied in the context of maximizing the efficiency of the assistance provided.

The question of whether the most seriously handicapped children are receiving service does not appear to be one that can be answered directly. It could be answered indirectly by comparing speech and related characteristics of children enrolled in caseloads of school clinicians with similar data about children with speech deviations who are not enrolled for therapy, but who are in the same schools from which the caseloads have been drawn.

The speech of these two groups of children can be described in behavioral terms. Their speech can be classified by quantitative measures or scaled for defectiveness. These populations can be described or qualified with a number of characteristics such as age, socioeconomic status, physical conditions, academic achievement, intelligence, and so forth. The results of such a study would not be a basis for judging whether school programs are serving children who are the most seriously handicapped, however, since these measures are not satisfactory criteria of the consequences of speech deviations. The results would describe the speech and related characteristics of children receiving service and the speech and related characteristics of the children not receiving service, and would demonstrate differences between the two groups. The results would not provide an objective foundation for either approving or condemning current case selection on the basis of services to the most seriously handicapped children.

A proposal to evaluate school or any other therapy programs with the intent to determine whether the programs are serving the individuals they ought to be serving cannot be justified in the absence of objective criteria for establishing the consequences of speech deviations. Since reactions to differences are a function of so many complex variables, an unequivocal criterion measure seems unlikely.

Summary and Conclusions

Those questions posed in the grant application not encompassed by the research design for assessing the effects of schedules and grade level at the time therapy is begun on articulation errors were reviewed. The question of prevalence of communication disorders among high-school dropouts was given a low priority for research, because of its narrow scope and the relative high cost of obtaining the information. A study of the prevalence of speech deviations among high-school graduates would be no more than a small-scale replication of limited portion of the national prevalence study already under way. It would, therefore, lack justification.

Whether school programs are serving children with the most seriously handicapping speech deviations was set aside. Objective criteria for the degree of handicap imposed by speech deviations are not available, since the acoustic aspects of speech are not the sole determinants of the consequences to deviations from the standard code. Such a study would have to be preceded by research to establish these criteria. If correct speech is a desirable end result of an educational program, it appears as though that all children should be given an opportunity to acquire it.

CONCLUSIONS

The issue of early versus delayed therapy for school-age children pertains primarily to children with "functional" articulatory deviations. A survey to determine how many children would overcome communication problems without assistance by comparing the number of children with speech deviations in schools having speech and hearing programs with the number of such children in schools not having these programs has so many limitations that it could not produce unequivocal results. Populations in schools that do not provide this kind of special service are likely to be different from populations in schools that have speech and hearing programs because of socioeconomic status and the quality of the regular instructional program. Some shifting of children with communication problems to schools where special services are available occurs, which would cause prevalence figures to be distorted. Not all children in schools with therapy programs can be enrolled; some children who have had therapy will be found in schools not having a therapy program. Determining the therapy history for children in these populations would be unduly expensive. Finally, the important aspects of therapy could not be held constant in a survey. Under these conditions, little meaning could be derived from comparisons of treated and untreated groups.

An experimental approach is more useful for resolving the issue of early treatment for children with "functional" articulation problems. Frequency with which therapy is scheduled, duration of the therapy program, grade level when therapy is begun, type of therapy, and group size could be controlled. Speech status prior to therapy could be determined. Changes in articulation skills of children receiving therapy could be compared with the changes in articulation skills of children not receiving therapy. In addition, the effects of the therapy situation itself could be isolated from the effects of instruction.

Conducting an experimental program in schools is difficult. Maintaining untreated control groups would create public relations problems for schools. Groups established for the purpose of isolating the effects of the therapy situation from the effects of instruction have a similar potential for creating difficulties; staffing for these groups poses a dilemma. Attrition in the experimental population due to the mobility of school populations and to children's receiving service from nonschool agencies requires beginning such a project with a much larger population than required by the actual research design for the analysis of results.

Since a method for measuring speech skills objectively does not exist, considerable time is required for training participating clinicians to make uniform judgments. The need to screen thousands of children in a very short period of time creates additional staffing problems.

Prevalence studies of communication problems among dropouts and high-school graduates were considered. The former was given a low priority because of its limited scope and excessive expense. The latter would only duplicate a small part of a national prevalence study already in progress.

The consequences of speech deviations have not been explored in depth. The degree to which speech deviations are handicapping depends on many conditions, some of which cannot be measured objectively, not just the speech pattern alone. Therefore, an adequate criterion measure is not available for determining whether school programs are providing service to the children with the most seriously handicapping communication disorders.

An overall evaluation of school speech and hearing programs is not feasible until standards based on objective data have been established for such things as optimum age for beginning therapy, efficient scheduling, effective group size, dismissal criteria, efficient treatment methods, and so forth.

SUMMARY

The age or grade level at which a child should receive assistance with his speech is one of the unresolved issues in school therapy programs. The issue of early or delayed therapy pertains primarily to children with "functional" articulatory deviations. The overall efficiency and effectiveness of school programs is directly related to the management of young children with articulatory deviations. About 81% of the average school caseload is composed of children with articulatory problems. Survey figures indicate that approximately 75% of the school clinicians work primarily with children in kindergarten and the primary grades.

Current normative data on the acquisition of articulatory skills are contradictory. Since speech is a learned behavior, the learning situation rather than maturation is likely to be the more important variable, at least as far as children of school age are concerned. Positing maturation as the main variable on which articulatory skills depend overlooks the association between articulatory skills and other language disabilities--an association known to exist in many children--and the potential for educational failure in the absence of early intervention. Research based on the assumption that articulatory disorders are homogeneous has minimized the chances of identifying those types of deviations associated with pervasive language disability.

A survey was examined as a potential method for determining whether early therapy for children with articulatory disorders is necessary. The limitations of a survey for this purpose were identified and discussed. It was concluded that a survey could not produce unequivocal results.

A research design was developed for determining the effects of schedules and grade level at the time therapy is begun on articulatory skills. The plan for this longitudinal experimental study called for screening a population of 30,000 kindergarten children in order to identify an experimental population of 724 children representing the second and fourth quartiles of the population with functional articulatory deviations. Children within this population would be randomly assigned to one of three groups: therapy, special attention, untreated. Some therapy and special-attention groups would begin at the time the children are in kindergarten; others would begin in first grade; still others would be postponed until second grade. Within each of these therapy and special-attention groups, some children would be scheduled twice weekly; others would be scheduled four times weekly.

The results of this research would indicate whether therapy is more effective in producing correct articulatory skills than vicarious learning. The research would allow the optimum grade

level for beginning therapy and the more efficient of two schedules to be determined for children with moderate and with severe articulatory disorders separately. The special-attention groups, established to control the Hawthorne effect, would isolate the effects of therapy from the therapy situation itself.

The problems of controlling important variables in schools were examined in detail. These problems are complex and make well-controlled research in a service-oriented environment difficult. Nonetheless, written statements of interest in participating in the research project designed were obtained from two school districts, a special-education district, and a large county schools office.

Prevalence studies of communication disorders among school dropouts and high-school graduates were considered, but rejected as impractical under present circumstances. Present knowledge about the consequences to speech deviations is so nebulous that a satisfactory criterion measure is not available for determining whether school speech and hearing programs are serving children with the most seriously handicapping conditions.

A tremendous body of information must be developed before school speech and hearing programs can be evaluated with respect to standards for efficient and effective practices. Surveys are not suitable for deriving this information. Standard research procedures are difficult to implement in schools. New ways of meeting a problem of this magnitude need to be explored. Consequently, an alternate procedure for resolving some of the issues attendant upon school speech and hearing programs was developed and is reported in Section II.

SECTION II.

INTRODUCTION

The Problem

An obvious approach to evaluating speech and hearing programs in public schools is that of evaluating programs with respect to some standard. The number of programs functioning below, at, and above the standard would be determined. Today, there are no data on which to base standards with respect to such important aspects of programs as caseload, diagnostic procedures, case selection, scheduling, dismissal criteria, and so forth. Before such an undertaking could be accomplished, it is necessary to have objective data about the most efficient and effective practices in many aspects of therapy.

An experimental study was designed that would produce information of significance about two critical issues in school therapy programs, namely, the optimum age for beginning therapy for children with functional articulatory disorders and the frequency with which therapy should be scheduled. This study would not, however, explore more than two of the many possible schedule variations. Furthermore, it would explore only two levels of the severity parameter based only on a quantitative measure of articulatory errors. It would also be limited to one therapy method. These data, which would have to be obtained through a very large and expensive study, would make no more than a small contribution to the total information necessary for formulating standards based on objective data for school speech and hearing programs.

The many difficulties attendant upon implementing adequate controls for research in the school situation are discussed in Section I of this report. These problems, coupled with the small amount of information that such a study could produce relative to the total need for information, suggest that alternate approaches be explored.

Since so much information is necessary and since a single research project contributes so little information relative to the total amount needed, it seems reasonable to attempt to involve school clinicians generally in research activity. Many clinicians working in schools are not trained in research procedures; furthermore, clinicians are employed to provide service, rather than to conduct research. Even so, there are a number of reasons why school clinicians should be more active in contributing to our fund of knowledge.

A great deal of time and effort has gone into identifying research needs. Hanley (35) described a plan of study for assessing research needs in speech pathology and audiology. The results of the study were summarized by Johnson and Hanley (43, p. 76): " . . . the profession of speech pathology and audiology stands in critical need of intensified research effort both in breadth and scope." In 1961, Pronovost and others (66) described current status and needs for research on public-school programs. Even earlier, Templin (86) wrote about some of the possibilities of research for public-school clinicians. As late as 1965, J. Irwin (37) again defined research needs in speech and language pathology and audiology as they exist for school programs. Nonetheless, the unresolved issues pertaining to school speech and hearing programs remain about the same as they were six to ten years ago. Professional researchers have shown relatively little interest in the kinds of problems that materially affect the conduct of school programs. Unless school clinicians begin to resolve these problems, there seems little reason to suppose that this situation will be different ten years from now from what it is today.

Even though school clinicians are employed to provide service, surely any professional group has a responsibility to subject its services to ongoing, objective evaluation. Such evaluation must necessarily be based on objective evidence rather than personal bias and should be of sufficient breadth and scope that it has meaning beyond the immediate situation or sample. In this respect, research is not ancillary to service but a necessary part of it.

School clinicians treat more clients than clinicians in almost any other setting. Yet, many of these clinicians feel that research is not producing as many answers to important questions as they desire. Some feel that much of our research holds little value for the practicing clinician. They suggest that the kinds of areas in speech, hearing, and language that need comprehensive investigation are as follows:

1. Case identification
2. Case selection (including diagnostic procedures)
3. Appropriate age for beginning therapy
4. Frequency of therapy sessions
5. Length of therapy period
6. Group size
7. Nature of grouping (homogeneous versus heterogeneous)
8. Dismissal criteria
9. Methods

Two kinds of methods studies are needed. The effects of therapy based on various theories need more study as well as particular operations within a given method. Data from an unpublished questionnaire by Ronald Sommers illustrate this latter need. His questionnaire was addressed to school clinicians and requested that they rank five aspects of articulation therapy according to difficulty. Of the 176 respondents, 134 ranked carry-over of new sounds into spontaneous speech as most difficult. The least difficult areas were teaching production of defective sounds and teaching ear training on defective sounds. Obviously, the area most needing further study is that of habituating new articulatory patterns.

Two observations about this listing of problem areas are appropriate here. First, with the exception of case finding, all of the areas require response-to-treatment as a part of any research design from which more efficient procedures might be inferred. Second, five of these areas were identified as needing research, either urgently or moderately, by clinicians and supervisors in 1961 (66, p. 117). Frequency with which therapy should be given received the highest priority from clinicians and supervisors alike.

With the exception of case identification, these problems are not school problems per se. The need for more and better information applies equally to all settings in which children receive speech or hearing services. Nonetheless, most of the children receiving service are in public schools. Pronovost and others (66, p. 119) have stated the case for research in schools:

> The logical laboratory for research is the public schools themselves. Too often when research has been concerned with public-school children, the school has been used only as a convenient place to meet the children to be studied. Future research needs to be focused on the children as they function in public-school situations. The entire school program must receive research consideration.

If research is to be conducted in schools, if research results are to have meaning for school personnel, and if solutions to problems are to be those that can be incorporated in the school situation, school clinicians themselves should be responsible for the research. Furthermore, in order for research to be combined with the service that they are employed to provide, large numbers of school clinicians should be involved. Thus, the amount of time each would need to spend in research activities could be minimized. The following discussion sets forth the rationale for these assertions.

Schools are the only unbiased source of study populations. Populations in nonschool settings are biased by the selective process whereby individuals reach or are admitted to nonschool agencies.

Study populations need to be maintained in their normal milieu and to be tested or treated under those conditions that represent normal settings.

The school clinician is already in the same setting as the desired study population. He is identified as a part of the school and has automatic entree to it. He is familiar with policies in the schools in which he works and can be held accountable for breaches thereof. It is expensive to place teams of researchers in schools or to move them about to cover a variety of geographic and socioeconomic areas. School administrators are necessarily cautious about permitting strangers over whom they have no real control to work in their schools. Relations between school and parents are sometimes tenuous. Sometimes good relations have been achieved only with considerable effort. Administrators are frequently unwilling to risk incidents that might strain these relations by allowing outsiders access to school populations.

Involving school clinicians in research solves many otherwise difficult sampling problems. A large number of clinicians can contribute to a given study. Such a group of clinicians invariably come from a variety of training programs, work in schools with differing policies and practices, represent a range of experience, and serve children from an array of socioeconomic and experiential backgrounds. Research results can be generalized not only to children but to clinicians as well, thus allowing confidence that the results of a study are likely to obtain for most any school program. Without a reasonably large sample of clinicians, it is impossible to determine to what extent widespread use of a particular technique or method would result in findings similar to those from a given study.

The school clinician is hired to provide service. Certainly parents and teachers expect service rather than experimentation. Most school administrators concur. Furthermore, some school programs are financed in such a manner that whatever time the clinician devotes to activities not involving direct service to children is not reimbursible; that is, the time cannot be counted in attendance reporting. By involving a large number of clinicians, each individual would contribute only a small amount of time. The effect on the total amount of service available and the reduction in reimbursement would be so small that the program would not be affected materially. Permission to engage in research usually can be obtained under these circumstances.

The know-how of the experienced school clinician is a necessary qualification to assure reasonable confidence that results of a study are applicable to other school clinicians. Graduate students who conduct research are often inexperienced as clinicians. Usually, they conduct their research in a situation for which they have no responsibility for long-term relations. The experienced researcher is most often found in a laboratory or restricted clinical situation.

When he does conduct research in schools, this environment is temporary for him. Exceptions to ordinary practices can be made that would not be feasible or even tolerated on a more permanent basis.

The experienced school clinician should be involved in problem identification and in determining appropriate ways of finding solutions for them. Certain restrictions are inevitable in selecting topics for research by graduate students. The professional researcher may have had previous experience as a school clinician, but previous experience is not the same as ongoing current experience. The fact that the professional researcher chose to leave the practice of speech and hearing therapy in schools to engage in research has removed him from the set composed of school clinicians. Similarly, the supervisor has removed himself from this set. Problems perceived by supervisors are not necessarily those that are perceived by individuals with the daily responsibility of providing direct service to children. It seems likely that school clinicians will continue to reject the non-school clinician's statement of problems as well as his proposed solutions to them. Many reasons exist, of course, for this attitude; not all of them are directly related to the research currently being produced. More progress will be made if the school clinician himself becomes involved in solving his own problems as he sees them. His involvement in identifying problems, formulating solutions, and testing them through research should maximize the chances that the results will be meaningful to him and subsequently incorporated into his practice.

A number of techniques or procedures developed in the laboratory or tested by a very small number of researchers need to be subjected to field tests before their value for general application and use can be generated. Here, again, the use of a large number of clinicians and the sampling of children thereby provided are ideal for such field tests.

Relatively little research has been conducted by school clinicians since the Pronovost report (66) was published in 1961. Nonetheless, this report contains the following statement (pp. 118-119).

> The National survey has demonstrated beyond question that research activity in the public schools can and must be intensified. Many of the unanswered questions and the unresolved problems revealed by the data of the survey require systematic research to provide answers.

Of the group responding to the questionnaire (66, p. 117), 73% of the 141 supervisors and 62% of the 705 clinicians indicated that attitudes in their school systems toward school-conducted research were favorable. Only 18% and 29% of the two groups, respectively, indicated that their school systems were indifferent toward research. Less than 5% reported unfavorable attitudes.

The reasons that school clinicians ordinarily do not engage in research are obvious enough. The time demands of the service function for which they are employed are often inimical to research. The proportion of school clinicians sufficiently trained in research procedures to undertake it independently is small. The following list enumerates a few of the difficulties that are encountered by school clinicians who desire to undertake research:

1. Developing and writing a substantial research plan is time consuming and must be accomplished after working hours.
2. The necessary secretarial assistance is usually not available to the clinician.
3. Consultative services are almost always necessary. Neither funds nor time for consultation are provided by schools; yet most grants are made on the basis of a plan submitted, and it is during the planning phase that assistance is most often required.
4. Sampling problems are nearly insurmountable. In order to have a reasonable sample of clinicians and children, it would be necessary to enlist the cooperation of other clinicians. Obtaining this kind of cooperation requires considerable time. Usually, voluntary cooperation would be limited to those clinicians in the immediate vicinity.
5. The amount of time required for testing or other procedures necessary to establish criterion measures for research in speech pathology is so great for a population large enough to warrant generalization that the service function is likely to be interrupted beyond reasonable limits. A significant amount of reimbursement for the program might be lost, or the service function neglected.
6. Data require tabulation and analysis. Suitable equipment and clerical help for this kind of work is not always available.
7. A report must be written--a laborious and time-consuming job. Results must be disseminated--a matter of some expense.

It is appropriate for school clinicians to assume more responsibility, perhaps the major responsibility, for research in schools. The disruption of routine service resulting from using a large number of children from a single school system as a study population could be avoided by dispersing a project over many districts. Other kinds of problems related to research in schools would be solved. A number of advantages would also obtain; foremost among them would be realistic solutions to problems of actual concern to practicing clinicians.

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Nevertheless, school clinicians who wish to engage in research are usually faced with a number of restrictions that make research activities not only extraordinarily difficult, but often impossible.

The Model

A research center designed specifically to encourage and assist school clinicians to engage in research appears to be a potential solution to the problem of resolving many of the issues related to school speech and hearing programs. Thus, the second phase of this project was devoted to a process of evolving and testing a model for such a center. The original formulation of the model was tentative. The purposes of such a center are unique, and no previous experience could be drawn upon. At the outset, it appeared that such a research center, when fully developed, might perform the following services:

A. Research Activities - Center Initiated

1. Exercise ongoing surveillance of research needs pertinent to the practice of speech and hearing therapy in schools by maintaining an up-to-date analysis of reported research and research-in-progress.

2. Develop a program of interaction with school clinicians through the national and state speech and hearing associations in order to obtain first-hand knowledge of school clinicians' reactions to current issues pertaining to the services they offer and to identify research needs as seen by the clinicians themselves.

3. Design significant studies in those areas identified from the above activities.

4. Implement the studies selected by

    a. enlisting the cooperation of an appropriate number of participating clinicians and samples of children;

    b. underwriting the cost of such materials, supplies, and equipment as may be required for the studies, but which are not available in schools; and

    c. providing qualified personnel for testing and so forth for those studies requiring more testing or evaluation time than school clinicians can contribute.

5. Maintain supervision over the studies as needed to insure uniformity of procedures.

6. Receive, tabulate, and analyze data that are fed into the center from these studies.

7. Prepare reports of research and disseminate them.

B. Research Activities - Consultative

1. Receive requests from school clinicians for assistance in developing studies that they wish to initiate.

2. Design research as requested using whatever consultative services from other fields as may be necessary.

3. Upon request, provide the same services to these clinicians that are available for center-initiated research.

4. Replicate these studies when appropriate.

C. Information Storage and Retrieval

1. Abstract data that pertain to the practice of speech and hearing therapy in schools from research activities in speech pathology, audiology, linguistics, and related fields.

2. Classify and store these data for immediate retrieval so that all available information on a given topic or variable would be acessible without delay.

3. Maintain an up-to-date analysis of pertinent research movement based on stored data and research-in-progress.

4. Prepare and disseminate a yearly or semiyearly synthesis and critique of research movement.

The importance of an information storage system should not be overlooked. Researchers who do not have university or college libraries available to them are at a serious disadvantage when they need to review the literature pertinent to a given topic. Neither the individual's professional library nor the professional library of a school is likely to contain the tremendous number of publications in a variety of fields that contain information pertinent to our interests. A great many school clinicians work in communities far removed from the resources of college and university libraries. Even the clinician who has a college library readily available to him is faced with a time-consuming job of searching out the information he needs. Abstracts of reports of research do not contain sufficient information to permit evaluation of research methods or procedures. A printout of various portions of the research report itself in a format that is complete enough for evaluation is needed.

An additional area of service that might be undertaken eventually by such a center is that of maintaining or facilitating certain types of surveys. The surveys might be concerned with school speech and hearing programs in areas such as program organization, methods and related practices, caseloads, working conditions, credential requirements, supply of and demand for clinicians, salaries, and so forth. This kind of research does not solve problems; it merely indicates the status quo. It does, however, help to identify problem areas.

METHOD

The proposed model for a research center was tested primarily by working on research projects with school clinicians. Thus, the actual problems encountered would indicate the services needed as well as determine the potential of a research center for making a contribution to the body of knowledge needed for increasing the effectiveness and efficiency of school speech and hearing programs.

Since spontaneous interest in using such a center needed to be reflected in the test of the model, the kinds of projects used for this purpose could not be anticipated in advance. Most of the field testing was done in California. Confining the project to a somewhat circumscribed area was dictated by budgetary limits. It also became apparent that informal communication among clinicians is the most effective means of stimulating interest in research and the services of the Center--an additional reason for the relatively restricted geographic area covered.

A total of eight research projects have been involved in the testing process. Four of these projects evolved from requests for assistance with projects already initiated; three were initiated by the Center. One of the eight projects consisted of a series of projects. In this case, the Project Director was requested to present research possibilities, and the clinicians chose among the plans presented or suggested their own. Each of the eight projects illustrates a rather different set of problems from which implications for the kinds of services that are needed may be drawn.

Committee-Conducted Research

One of the requests for assistance came from the California Speech and Hearing Association Research Committee. This committee has been actively engaged in research since 1962. Its two major purposes, which have evolved over the past four years, are a) to undertake studies of professional problems, and b) to investigate those issues requiring the unique coordination and cooperation that the Association's membership can provide.

The committee's first major project, developed in conjunction with the State Department of Education, was a caseload study (19), which has had a major impact on speech and hearing services in California schools. Specifically, this study demonstrated the necessity of establishing a maximum caseload; at the present time caseloads may not exceed 90 at any one time. This committee has also completed several other studies. This group had already demonstrated the capability of a volunteer (nonpaid) committee to conduct research; therefore, the potential for research sponsored by state speech and hearing association research committees appeared to warrant further exploration.

The Project Director began working with the CSHA Research Committee in January, 1966. The relationship was reciprocal: consultation and a certain amount of service were to be given in return for the opportunity to work through some of the problems of statewide research conducted by a committee whose membership was primarily made up of clinicians working in schools.

The major project undertaken by the group was an opinion survey of current practices and recommended practices in the area of supervised clinical practice in schools, which is required for student clinicians. The questionnaire was in the process of being developed at the time the Project Director joined the committee as a consultant. The Project Director assisted in completing the study.

The pilot phase of a second project was completed. The school clinician's role in test administration suddenly became a critical issue in the state. The original plan was to determine through a survey which tests school clinicians now use and which tests they feel they should be permitted to use. The first step was to conduct a survey among directors of college training programs. As a result, the questionnaire has been refined, and the list of the tests most likely to be used has been developed.

Other activities of this committee now in progress include the preparation of a proposal for a statewide conference on practices in supervised clinical experience in schools based on results of the survey. Hopefully, a set of minimum standards, acceptable throughout the state, can be evolved from the conference. Another study is being formulated that deals with the use that school clinicians make of consultative services for children--their availability, school and agency referral procedures, and interagency communication. A proposal for a research conference is also being formulated. The conference would be somewhat similar to the New Orleans Conference on research for public-school speech and hearing personnel, which was sponsored by the American Speech and Hearing Association and the U. S. Office of Education in January, 1966. The major difference would be the emphasis on actual production of research. That is, more can be learned about research by doing it than by talking about it.

Research in a Large Metropolitan Area

One of the projects undertaken in order to explore services that might be offered by a research center was assistance in formulating a research proposal for the Los Angeles City Schools and school districts in Los Angeles County. The proposal was the outgrowth of the development of a standard case record, which was nearing completion at the time the Project Director was consulted. A research proposal was formulated for a study of the characteristics of 25,000 children receiving speech and hearing service in Los Angeles area schools.

Research in a Small School District

A third approach to the study of research conducted by school clinicians evolved from a request for assistance with a procedure for evaluating the communication skills of kindergarten children. Three clinicians, who represent the entire clinical staff of the Novato Unified School District, requested help in refining a program that had already been established. This project represents the kind of research that is an essential part of a service function.

A Series of Projects in a Large School District

One of the ways in which research in schools can be developed is through a staff of clinicians who are interested in research, but who need some assistance in transposing recognized problem areas into research questions. A series of research possibilities that could be executed in conjunction with regular school assignments were presented to the speech and hearing staff of the Indianapolis Schools. These possibilities suggested others. Clinicians voluntarily selected topics from among those presented; others formulated their own. Enough similarity of interest developed that four groups were formed. These groups work as teams, each team having a specific project. After discussions with each group, the Project Director provided research plans in writing. Four projects are currently underway as a result of this procedure.

Research Under Unusual Circumstances

One request for assistance developed from a requirement for evaluating a speech and hearing program as a part of an overall evaluation of a compensatory education program. This large school district had employed a research firm to evaluate the program. As might be expected in so specialized an area, these researchers did not know what criterion measures would be appropriate for the evaluation. The speech and hearing staff were assigned to supply what amounted to a research proposal for assessing this aspect of the program. Since the job specifications for school clinicians and their supervisors do not include research competency, it is not surprising that outside consultation was necessary. This kind of research is critical, since continuation of this aspect of the program depends on the outcome of the evaluation.

Coordinated Research

The purpose of one of the studies initiated by the Center was to explore the problems of coordinated research. In this project, a research proposal was presented to clinicians in four school districts and two county schools offices. Two other clinicians, one from each of two districts, also participated.

Research Involving Classroom Teachers

Another study initiated by the Center involved a cooperative project. Its purpose was to determine the feasibility of delegating the responsibility for a preconceived research project to a clinician at some distance from the Center and simulataneously to examine the problems of involving classroom teachers in research requiring information that only they could supply.

Agency-Sponsored Research in Schools

The third project initiated by the Center was of an entirely different nature. The purpose of this study was to determine whether routine school records for a population of exceptional children who had had extensive evaluations would provide data retrievable for research purposes. In addition, problems of introducing researchers who are not affiliated with the schools and coordinating their activities could be studied. This project did not involve school clinicians.

All of the children enrolled in the Rio Linda School District's program for educationally handicapped children were tested by the Project's research assistants in order to determine the prevalence of speech disorders in this group. Certain information was abstracted from school records for the purpose of determining whether a relation exists between speech deviations and academic achievement should the information be sufficiently uniform to permit it.

Other Activities of the Research Center

In addition to the projects enumerated above, discussions about research were held with a number of clinicians, either individually or in groups. One workshop and one symposium were conducted.

RESULTS

The process of evolving and testing a model for a research center for school clinicians produced two kinds of results. One set of results pertains directly to the model itself and is concerned with what was learned about conducting research under the circumstances described. The second set of results is the research projects completed or the plans and procedures developed for research still in progress. Information about the services that a research center should provide based on the projects undertaken will be discussed first. The results of the research projects that were conducted and the plans for those still in progress from which this information was obtained are included in the second part of the Results portion of this report.

I. SERVICES AND FUNCTIONS OF A RESEARCH CENTER FOR SCHOOL CLINICIANS

Committee-Conducted Research

A state speech and hearing association research committee is uniquely situated for conducting certain kinds of research. It has advantages that no other circumstances are likely to produce. Such a committee has almost unlimited short-range consultation available to it, as it is able to call upon the many specialists who are affiliated with the parent association. The committee can be structured to bring together individuals from a variety of work environments representing many points of view. It can solicit and obtain the cooperation of the training institutions in the state. Whatever research it produces is accredited to the professional organization rather than to an individual or institution.

Most importantly, a state speech and hearing association research committee has available to it a ready-made communication system through the association's meetings and publications. This communication system, when augmented by the services of state department of education speech and hearing consultants, can disseminate information and obtain cooperation through face-to-face encounters. California's state organization has the additional advantage of being divided into three regions; each region usually has three meetings a year of its own in addition to the statewide annual meeting. The regions also have their own newsletters. This arrangements makes for an excellent communication system.

The kinds of research most appropriate for such a committee are those that involve professional concerns of broad scope--studies that depend upon statewide participation of many clinicians and that would probably be impossible without the communication network available to it, studies that reflect a proper concern of a profession for the quality of the services that it offers. Such studies tend to be, perforce, surveys that describe existing conditions or identify problem areas.

An obvious first question is whether a volunteer (nonpaid) committee can actually engage in the exacting attention to detail required by research. This question is particularly cogent when that committee is made up of clinicians who, for the most part, have had little or no training and experience in research and whose job responsibilities do not include research. The strength of such a committee, however, lies in its freedom from domination by a particular research orientation such as is developed by the full-time researcher. The California Speech and Hearing Association Research Committee is composed primarily of four clinicians who are supervisors or coordinators of school programs, consultants from the state department of education, one professor, and a director of a medical school speech and hearing clinic. The question, of course, has already been answered affirmatively, at least as far as this particular committee is concerned.

The services of a research center can contribute materially to the activities of such a research committee. In the first place, there is a limit to the amount of time that an individual can contribute to a professional activity over a long period of time. Changing committee membership in order to preclude an undue drain on any one person's time is inefficient--experience is lost and working relations must be re-established. In addition, professional skills are wasted if these people use their time for routine clerical work, but funds are not available for hiring these services.

In the present instance, the Center tabulated the results of the opinion survey and the Project Director prepared the initial draft of the report, which was subsequently edited by the committee. It seems safe to say that without this assistance, the report would not have been completed by this time, nor would the proposal for the conference be nearly completed. The data are of less importance in and of themselves than the use that will be made of them. Having served to verify the existence of problem areas as far as clinical practice in schools required of students is concerned and having demonstrated significant differences of opinion about requirements that should be included in an ideal program, these data not only justify further study but can be used to formulate the basic issues around which a conference for developing minimum standards can be structured.

Even with so much consultation potentially available to the committee, there is still value in having a research consultant who can help a committee sift through the copious advice it receives. It seems equally important that this consultant's job responsibilities be that of concern for other people's research rather than his own. Research sponsored by a professional association should not take on the appearance of research fostered by a particular college or university. A part of the cooperation so unique to association-sponsored research would be lost were this to occur.

Still another reason for a consultation service that could be drawn upon by such groups began to emerge while working with this group, though it became even more apparent in one of the other studies. Specifically, a certain amount of research background and experience is necessary for effective use of consultants. Stated differently, effective use of consultants is dependent upon knowing what questions need to be asked as well as knowing how to formulate them so that the consultants can give helpful answers.

A third condition pertains to the use of consultants by research committees. The very large number of professional people that can be drawn upon to contribute highly specialized knowledge does not mean that these same people can be expected to contribute a considerable amount of time. A consultant who can stay with a project from its inception to its completion can contribute to the project in a way that is not possible if consultation is fragmentary. Such service is particularly important for a group without extensive research training. Of course, both kinds of assistance are needed.

The value of a state speech and hearing association research committee and the resources made available to it through a research center was illustrated by another situation. The committee itself can mobilize action quickly when data are needed. Additional assistance expedites management of some of the routine details of research.

During the past year, action was threatened that would seriously interfere with clinicians' ability to perform their jobs. Some school districts already place rather severe restrictions on clinicians as far as the administration of tests is concerned. These restrictions extend to many of the tests generally considered to be a part of a routine diagnostic battery essential for accurate assessment of speech deviations. The action proposed, which was being actively promoted, would, in effect, prohibit clinicians from administering any tests except, perhaps, speech tests, though even articulation tests could be interpreted to fall under the regulations set forth. While clinicians in many school districts had long suffered from being denied the right to administer tests they had been trained to give, this action clearly demonstrated that the matter had become critical. It illustrated with equal clarity the need for more direct information about tests school clinicians currently use, and how widespread and rigorous existing restrictions actually are. In short, the status quo with respect to tests needed to be determined, as well as the magnitude of the problem that would be engendered by further restrictions.

This problem is of broad professional scope, and one that has serious implications for the quality of services that school clinicians can give. Furthermore, it is not a problem likely to be studied by an individual researcher. It has been a problem of long standing, yet no data are available. Therefore, the CSHA Research Committee quickly formulated a questionnaire and secured the cooperation of directors of 18 college and university speech and hearing programs in responding to it. A list of tests most likely to be used could be formulated from these responses so that a questionnaire sent to school clinicians would be comprehensive yet as short as possible. In addition, training in the use of tests could be inferred from the results of the directors.

Here, again, the services of the Center were called upon. The questionnaire was formulated by the Center and reviewed by the committee. The chairman of the committee was responsible for securing the cooperation of the directors of training programs while they were convened at the annual CSHA convention. The Center tabulated the data, and the committee disseminated the results. Since the action that gave rise to the study has been withdrawn temporarily, no further action has been taken to complete the survey. Since the survey was started at the time the aforementioned opinion survey was in progress, it has been deferred until later date.

As it turned out, a study of this magnitude could have been handled easily enough by committee members. Had it been carried beyond its first stage, as originally intended, the task would have been too great to have been accomplished quickly. Even so, the Center did contribute materially to the speed with which the first phase was completed.

As a result of the assistance from the Center, this research committee sponsored by a state speech and hearing association has completed one large study and the first phase of a second study. A proposal for a statewide conference based on results of the opinion survey about school experience for student clinicians is nearing completion, as is a proposal for a conference on research for school speech and hearing personnel. A pilot study for a project about referral resources used by school clinicians and interagency communication will be completed in March. This study will use the personal-interview technique. The interview will be refined during the trial runs at the annual convention of the association. It appears, then, that a research center can maximize the productivity of such a committee. In turn, research facilitated by the unique communication system and cooperation found in a professional organization can be fostered in this way.

Consultation and report writing are services that need to be supplied by the professional staff of a research center. Clerical services for tabulating data in the absence of a budget for computerized data reduction are also necessary.

Research in a Large Metropolitan Area

At the outset, it was assumed that the services of a research center would not be needed in large metropolitan school districts, since these districts usually have research departments of their own.

It was similarly assumed that the services of such a center would not be needed by school clinicians in communities in which colleges and universities are located, since faculties in these institutions are resources for consultation. Neither of these assumptions were correct.

The existence of research departments in schools is no guarantee that resources are available to clinicians who wish to formulate research projects. These departments have responsibilities assigned to them and are staffed to fulfill those responsibilities. To be sure, research-department personnel are available to answer specific questions, but such departments are not usually staffed to give extensive, ongoing service.

Since the personnel in school research departments usually do not have a background in speech pathology and audiology, they are unfamiliar with the important variables in these fields. Without a knowledge of the variables involved, it is difficult to design good research. On the other hand, without a fairly extensive background in research design in the field under question, it is difficult to discriminate among applicable and inapplicable information and advice provided by researchers with backgrounds in other fields.

In communities in which colleges and universities are located, the speech pathology and audiology faculties are obvious resources. However, not all faculty members have had research training. Many who have good backgrounds have not been engaged in research and no longer have confidence in giving advice about research. Those actively pursuing research are engaged in their own projects and have only a limited amount of time for consultation. Under these circumstances, answers to specific questions can be obtained, but college professors, like other professional people, can reasonably devote only a limited amount of time to other people's projects before their own work begins to suffer. Furthermore, considerable difference exists between the problems that tend to interest researchers in the college setting and those of interest to public-school personnel. The realities of the school situation create problems not encountered under the easily controlled conditions of a laboratory. These considerations reduce the number of faculty members that might be called upon for assistance.

Under these circumstances, consultants are best used to clear up a few technical matters in an otherwise well-developed research plan. Assistance in the laborious working through of numerous details is usually available only from a paid consultant.

Some, perhaps most, schools are structured so that funds for data input and computer time must be transferred from the department requesting these services to the research department. Usually, school budgets for speech and hearing services do not include funds for research. Application to a granting agency is necessary in order to obtain funds.

Consultation is needed most during the planning stage of research. Funds for consultation are available from granting agencies once a grant application has been approved, but without consultation research proposals cannot be readily developed; thus, a vicious circle exists which depresses the amount of meaningful research that school clinicians can produce.

In some situations, the need for ongoing consultation does not necessarily lie in a requirement for specific technical skills. Sometimes one of the most important services that a consultant can render is that of providing continuity and perseverence in pursuing a project. The job responsibilities of supervisors and coordinators in very large school districts are extremely heavy. Daily decisions must be made about which demands on their time should be acceded to and which can reasonably be rejected. These pressures lend themselves to discouragement as far as research is concerned. The need to extend an already overcrowded workday in order to pursue an activity that requires aggressive action in establishing exceptions to existing routines can be easily set aside in preference to responding to a large number of immediate demands. In the research proposal developed for the Los Angeles area schools, the Project Director served primarily to maintain continuity in the development of the proposal.

This project demonstrates several facets of school research. In the first place, the proposed research is an outgrowth of a project not originally intended as research. In 1963, a group of supervisors and clinicians in the Los Angeles area set out to solve a practical problem. Specifically, critical communication problems among clinicians had developed because of the unusually high mobility of the school population in this area. Turnover in caseloads had become very high, and clinicians frequently had to transmit information to the clinicians in other schools. The information transmitted was variable in amount, areas covered, and format. The pressures of time under which school clinicians work meant that some information did not find its way into records; consequently, considerable duplication of effort was involved on the part of the clinician to whom the child was transferred.

A standard form for recording an abstract of information in case records seemed to be the most reasonable solution to this problem. The abstract would represent the minimum amount of information that should be available on each child in the caseload. Thus, the laborious task of developing an abstract acceptable to the clinicians who would be using it was begun.

Though the abstract was developed in response to a specific and practical problem, the usefulness of a standard abstract extends far beyond easy exchange of information among clinicians. A standard record form, such as the one that has been developed, is economical of time in terms of both recording and retrieving information. It insures systematic observation of the more important conditions and behaviors related to speech deviations. It is of material aid in the supervision of beginning clinicians. It specifies the kind of information that the district expects the clinician to obtain and can be used to determine those areas in which additional inservice training needs to be given. It is an aid to supervision generally; case information is immediately available in a form easy to peruse at the time the supervisor observes therapy. The data, if retrieved, provides the supervisor with information in depth that can be used in program planning and justification for staff needs and budget requirements. With an appropriate data-retrieval system, the supervisor can maintain surveillance over caseloads as they are being established and investigate unusual or atypical caseload development. As soon as suitable criterion tests and training materials are developed, these materials, when used in conjunction with the standard case record, provide instruments for establishing quality control over school speech and hearing programs that has heretofore been impossible.

The services provided by the Center in developing the research proposal for a study of the characteristics of 25,000 children receiving speech and hearing services in the Los Angeles area schools, which is based on the standard case record, are discussed in the following paragraphs.

The Project Director assisted in making final decisions about the content of each of the subsections of the case record in order to insure freedom from ambiguity as far as data processing is concerned. Specific details of the format were formulated at the Center. This draft was typed and reproduced at the Los Angeles County Office.

The case record in this form was field tested by 20 school clinicians under the supervision of the principal investigators. They also obtained reviews and evaluations from four speech and hearing consultants, eight professors of speech pathology and audiology, one clinician in private practice, and a director of a medical school hearing and speech clinic. The record in this form was also reviewed by clinicians in the school districts in the Los Angeles area, again under the leadership of the principal investigators. The Project Director presented the form to clinicians in three school districts in northern California and obtained their comments.

The Center received all reviews and compiled a report of the evaluations. Revisions suggested by these evaluations were incorporated into the final draft, which was then sent out for printing. The Project Director also assisted in preparing a booklet of instructions and in planning an instructional film. The case record is contained in Appendix A; a copy of the instructions is in Appendix B. Production of the film was the responsibility of the principal investigators. Expenses incurred from printing and filming were defrayed by the Los Angeles County Office.

The record form as it now stands is not intended to represent a final draft. It is currently undergoing re-evaluation by the clinicians using it in the Los Angeles area, in college and university clinics, and in other school districts as well. Certain subsections were known to need further elaboration at the time it was printed.

The Project Director assisted in the development of the four-year research proposal. This proposal underwent numerous revisions in order to produce a plan workable within the limits set by the job responsibilities of the principal investigators. A curious circumstance emerged from the planning phase--one that has significant implications for certain kinds of school research. It became evident that the nature of this particular project is such that it is completely dependent upon the capabilities for coordination that are indigenous to the full-time positions of the principal investigators. It is inconceivable that anyone without the principal investigators' job sanctions and long-established working relations with these districts could have obtained cooperation of the magnitude represented in this project. Furthermore, the success of the project is dependent upon the principal investigators' continuing to function in their regular capacities. A total of 39 school districts with a complement of 210 clinicians are now using the case record.

The Center prepared code material based on the Los Angeles census tract, which will be used for determining socioeconomic status. It also prepared the code sheets for transposing information from the case record into machine language for punchcard operators. The necessity for an intermediate step in the coding process represents one of the peculiarities of research in schools. Initial reactions to the case record were somewhat aversive. Its size was formidable. In order to make the record acceptable to school clinicians, it was necessary to eliminate all extraneous matter. The case record is intended for use for purposes other than the present project. The record had to be acceptable to school clinicians, or they would reject the form for either continued use or for the specific purposes of the research project.

The project as planned represents a total of 25,000 clock hours of clinician time needed for collecting and recording information. Each of the 210 participating clinicians will fill out an average of approximately 130 records requiring an estimated one hour for each. Obviously, a record form must have something to recommend it if its acceptance is to be voluntary. Thus, the inefficiency of having to transfer data to a code sheet was preferable to having no data at all. Furthermore, greater control over returning records to clinicians is possible, since machine availability is not a factor.

Detailed plans for studies of clinician agreement and reliability during the first year of the project are nearly completed, again with the assistance of the Project Director.

The services of a research center are useful even in large metropolitan school districts having their own research departments. Consultation is necessary in the development phase of a research proposal--a time during which funds are not available. A knowledge of both research and a special field is essential to successful use of research consultants with backgrounds in other fields. The continuity that a center can provide is valuable in assisting principal investigators whose main job responsibilities are other than research.

Technical services of experienced research assistants can be established and supervised in a research center. These services are needed for proposals encompassing research of considerable magnitude.

In this case, the Project Director completed the team necessary for completing the case record and for developing a proposal for research based upon it. The three members of the team had unique responsibilities, which automatically fell into place.

Research in a Small School District

This research project, like the Los Angeles study, also grew from an attempt to solve a practical problem. The problem was the procedures that could be used most effectively to evaluate the oral communication skills of kindergarten children in order to assess current or potential need for speech therapy or the need for referral for other professional service before a full determination of the need for therapy could be made.

One assumption was basic to the procedure being developed; namely, the oral communication skills of kindergarten children must be assessed in a situation in which a child could be observed as he functioned in his peer group, as well as through the more usual individual assessment in a face-to-face encounter between clinician and child. The research problem included structuring the observations of group behavior and determining the reliability of observations made in that situation, refining the individual test battery and determining interclinician agreement and reliability for this battery. Finally, whether both types of assessment are needed, and, if not, which situation provides the better information would have to be determined.

It might be noted here that the problem of the untreated control group, discussed at some length in Section I of this report, presented itself in this project. In order to check the validity of judgments made about kindergarten children's oral communication skills, no therapy should be given until the children reach third or fourth grade. It was the opinion of the participating clinicians that withholding therapy, at least for those children with the most extensive involvement, would be intolerable in this particular school district. Thus, only a partial check of the validity of the evaluation could be planned.

Considerable work had already been accomplished at the time the Project Director was requested to lend some assistance. Several groups of children had been evaluated by using the following procedure.

Kindergarten children, selected by their teachers as those with the most serious oral communication problems, were scheduled in groups of 20 for one hour on three successive weeks. Parents brought the children to a particular school for this purpose. One of the clinicians observed the group, while the other two clinicians tested individual children by taking them from the group. After the speech tests were completed, the parents met in a group to discuss the results. Several modifications of this program were eventually introduced. The procedures now being used are described in the second part of this chapter under the heading of A Procedure for Assessing Oral Communication Skills of Kindergarten Children.

The Project Director's services were almost exclusively those of consultation. Only a small amount of time was used for tabulating data and preparing reports. Consultation was needed at intervals extending throughout the course of the present project. Generally, each session was spent in comparing results from testing and observing the previous group and in revising procedures for the group to be scheduled next. Eventually, test materials were selected and observation procedures refined to the satisfaction of all participants. The first set of data about clinician agreement in making observations of children in a group situation indicated that these procedures have to undergo further refinement. Interclinician reliability in making individual assessments must be determined as well. When procedures have been refined so that agreement is satisfactory, the program will be ready for testing.

This particular project demonstrates the contribution that a consultant can make to the development of an important kind of research involving the services of school speech and hearing clinicians. It was necessary to spend considerable time in discussion, first to formulate the procedures so that they could be tested objectively, and then to work through each phase of the decision-making process involved in refining the procedures. The meaning that research has for school clinicians who do not have extensive backgrounds and experience in research and the commitment they develop for it appear to depend primarily on two conditions: a) the clinician must be confronted with a problem of immediate and practical significance to him; and b) he must participate in every step of the process of formulating the research design.

Through this project, it became evident that the kind of research that has not been done, but which would contribute significantly to program improvement, depends on procedures or methods that have to undergo considerable preliminary refinement before they can be put to a formal test. The process of refinement and testing usually requires a group of clinicians. Coordination is needed to implement the process. This is a service that can be provided through a research center.

A Series of Projects in a Large School District

The Project Director was invited to discuss research and research possibilities for school clinicians with the clinical staff of the Indianapolis City Schools. Of the 26 clinicians attending this workshop, 18 chose to participate in projects. One of the projects had undergone preliminary discussion prior to the workshop. The other projects developed from the presentation made by the Project Director but reflected modifications brought about by the particular interests of the clinicians themselves.

All four of these projects represent pilot studies. Two of them depend on further development or specification of materials and procedures prior to a more formalized research design. Two of the projects would not necessarily have been pilot studies except that the workshop was held during the first week of school, and normal services had to be scheduled immediately. Thus, classes had to be screened and tested before interclinician reliability could be established. Nonetheless, there are several advantages in small-scale, informal testing of a proposed project, particularly when participants have not had previous research experience. Materials and procedures can be refined and specified in detail before a major effort is devoted to a full-scale project.

One of the studies is concerned with a method for treating stuttering. Another involves the development and simultaneous testing of a method combining instruction in articulation and language skills. The method is being developed for children with defective oral communication skills who are of good intelligence but who are making poor academic progress in second grade or who have been retained in first grade. A third project deals with the remission of /r/-errors; a fourth, with stimulability. Plans for two other studies are to be supplied at a later date.

The services of the Project Director included the presentation of a workshop, followed by group conferences during which plans for each of the projects were discussed and developed. The Project Director then reported to the school's director of research and consolidated plans for continued assistance from that department.

Once a research plan has been prepared, much of the responsibility for guidance can be assumed by the school's research department. The way in which consulting services were used in this school system can be compared with the way in which they were used in the project undertaken in the small district where the responsibilities for ongoing assistance with details was assumed by the Project Director. Both ways of using consulting services appear to be successful, although the choice between these alternatives depends on the nature of the research problem.

Research Under Unusual Circumstances

The services of a research center oriented to the problems of school speech and hearing programs can be of great assistance in situations in which clinicians are required to evaluate a program but do not have the resources to formulate a plan for evaluation or to obtain the services of a paid consultant. It is apparent, too, that when speech and hearing services constitute only one part of an innovative program, the resources brought to bear on the assessment of the total program do not always cover this aspect of it.

Many speech and hearing programs have been and are being established for economically and culturally deprived children. If a program that must be evaluated objectively is established without anticipating this requirement, any attempt to arrive at conclusions about it are hazardous. The limitations of any plan to assess services post facto only are obvious. What is needed, then, is a resource that would be available to assist in the planning for evaluation prior to the implementation of the program. Not only would the necessity for program evaluation imposed by external requirements be met better if preplanning takes place, the speech and hearing program itself could be set up to maximize refinement of whatever approaches the clinicians responsible for it wish to employ. Two kinds of problems are involved, since the kinds of programs for which evaluation is mandatory generally call for modifications of the more usual speech and hearing programs to meet the needs of special groups of children. One problem is to determine the effectiveness of whatever program is being used; the other is to evolve those methods that are most effective. That is, several methods may need to be tried before the most effective ones are found. Unless the program is set up so that these methods can be evolved and simultaneously tested, the value of speech and hearing services cannot be ascertained accurately. Evaluating a new program without taking into account that the services included in it are necessarily in the developmental process is likely to result in distorted conclusions.

Ideally, the contingencies dictating the plan that was developed should not arise. That they did is one of the realities that must be met. It does seem advisable, though, to attempt to preclude their future occurrence.

Coordinated Research

On the basis of this first trial, it appears that coordinated research would be useful in producing large-scale studies. Administrators are willing to approve research that a) does not require any additional expense to the district, b) does not interfere with the clinicians' time, and c) that can be shown to contribute information of practical significance to the speech and hearing programs.

The percentage of clinicians willing to cooperate is satisfactory, and cooperation is excellent. Attrition in the subject population was much higher than anticipated. A description of the study from which these results were derived is shown in the next section of this chapter under the title of A Study of Coordinated Research.

Supervisors are generally enthusiastic about research projects requiring a limited amount of clinician time. Some felt that such a project would be a welcome relief from the ennui attendent upon routine school practice with a large number of children with similar problems. They also felt that such projects have a potential for meaningful in-service training.

Four considerations need to be kept in mind if similar projects are to be undertaken. A higher level of participation could be obtained by working more directly through supervisors and by channeling reports to and from the Center through supervisors. While cooperation must remain entirely voluntary in order to insure the return of accurate information, working more directly through supervisors would tend to imply tacitly that the project is to be regarded as a part of the clinician's assignment. To a limited extent, this implication is desirable; on the other hand, cooperation under duress would be highly undesirable. Second, entree into the school system depends upon acquaintance or relations with school personnel that are tantamount to a recommendation of the individual proposing the study. That is, at least one clinician of stature within the school must be able to recommend the individual introducing the proposal to other clinicians and to administrators. While this condition was not tested in the present study, enough examples could be cited to substantiate the contention. A third condition is that every precaution should be taken to simplify whatever reports participating clinicians are asked to make. The fourth is to recognize the responsibilities of building principals by making certain that they are informed of arrival and departure time of research personnel, even though district administrators have disseminated notices of approval to all principals. In short, conducting this kind of research is dependent upon good public relations.

For reasons which will be discussed later, a second undertaking of this nature should stress clinician participation in formulating the research proposal.

Delegated Research

A research design can be prepared and responsibility for conducting research can be delegated to some other clinician. In the study involving classroom teachers conducted by the consultant in the Nevada County Superintendent of Schools Office, the Project Director had no contact with any of the school personnel, except for the consultant, until the data had been analyzed by the Center and the report completed. Subsequently, the Project Director met with the teachers who had participated in order to explain the results of the study.

The second problem being explored in this project was cooperation of classroom teachers in providing information for research in speech and hearing. The research problem was to determine whether classroom teachers could reliably rank children on the amount of participation in classroom discussions. The results of the rankings are reported in the next part of this chapter.

Classroom teachers are understandably resistive to additional activities. They are not usually trained as researchers and lack enthusiasm for it. Negative attitudes toward research are further exaggerated when teachers are requested to participate in research about speech and hearing problems. The child's oral communication skills--articulation, voice quality, fluency--do not affect ratings of teachers' instructional competence.

Participants need to be confident that some useful purpose--a purpose that has meaning to them--is being served by a project for which their cooperation is needed. Since prior knowledge of the intent of the study might have produced a biasing effect, no background information could be provided about it. In order to minimize indifferent participation, teachers were reimbursed for their time at the rate paid substitute teachers in that county.

It was expected that the major complaint would be the amount of time required. Instead, it was found that a substantial number of teachers were fearful that administrators would judge them on their ability to perform the ranking task; that is, they saw this activity as a potential threat to their on-the-job competency ratings. The solution to this problem--using only tenured teachers or volunteers--is not as attractive as it seems at first glance. These restrictions would preclude random samples of teachers and the classroom conditions they represent.

Using classroom teachers to supply information about children's behavior is not entirely satisfactory. Motivation might have been enhanced had the purpose of the study been fully explained. Competition for teachers' time is so great that reimbursement is not an adequate solution. Finally, the insecurity felt by a number of teachers limits the amount of enthusiastic participation that can be expected from either random samples or specific populations of teachers. Though teachers are a potential source for a great deal of information about children with speech and hearing handicaps, no good way of getting at this information has been devised.

It appears, then, that the optimal conditions for research involving school personnel are more likely to obtain when the need for information is felt by the individuals involved and when they have had a part in planning and developing the procedures for obtaining it. Research in which teachers have no involvement other than to contribute requested information is somewhat unattractive. It seems reasonable that this same conclusion could be generalized to speech clinicians as well.

Agency-Sponsored Research in Schools

No difficulties were encountered in placing a research team in schools to conduct rather lengthy tests and to obtain case information. The importance of structuring procedures for the research team's functioning within the school environment cannot be overemphasized. Only two research assistants were involved; furthermore, both had been former students of the Project Director. Thus, a firm set of expectations existed on both sides. Fortunately, in the present study, no situations arose that had not been anticipated in advance and covered by policies for handling them. Nonetheless, enough situations arose that required administrative decisions to indicate that a research team should not be placed in a school in the absence of immediate, personal supervision of the person with the ultimate responsibility for the project.

Another important result from the project initiated by the Center involving speech evaluations of children placed in the program for educationally handicapped children relates to data retrieval. This particular population was chosen not only to determine the prevalence of speech deviations among educationally handicapped children, but to determine whether school records as ordinarily kept provide information useable for research purposes. The problem was examined under ideal rather than average conditions of record keeping.

The records on this population were extensive, through, and kept in excellent order. Nonetheless, the problems anticipated were verified. School records are not kept for data-retrieval purposes. The limitations discussed below in no way pertain to the adequacy of the records for the purposes for which they are intended; rather they are restricted to such use as may be made of them in research.

While narrative records are useful for clinical and teaching purposes, retrieving information from them is not only laborious, the data are incomplete. Categories of information were established from a sample of seven records. Information pertinent to these categories could not be filled in for all subjects. In narrative material, often only the most salient information is recorded. It is impossible to determine whether the lack of information means that the category was not covered in the interview or whether it was covered, but the history was negative.

Each folder also contained some information obtained from structured interviews. The information was recorded in blanks provided beside the listing of each topic. In the sense that standard terminology provides a codifying system, the terms used varied too widely to be coded in all cases. For data retrieval, information needs to be recorded using a specified set of terms that have established meanings and are used uniformly by all professional workers.

In order to take advantage of the tremendous amount of information collected by schools, a code system needs to be established. The pioneer effort of Rehabilitation Codes, Incorporated, in New York suggests that a similar effort to establish a code for data pertaining to school children could make a significant contribution to the advancement of knowledge in education for both "normal" and exceptional children.

A third important finding is that the analysis of oral language skills using the procedure established by Templin (85) is impractical as an assessment tool for school clinicians. Only the structural complexity scores for the children in this population were of interest in this case. While the time required for making tape recordings of spontaneous speech is nonsignificant, two independently typed transcriptions from the recordings required approximately one hour because of the need to relisten to the material in order to establish sentences. The number of differences in two independent transcriptions of the recordings ranged from 14 to 59. Four different combinations of transcribers were used. The research assistant computing structural complexity scores had to relisten to each sample in order to reconcile these differences. The time required to complete structural complexity scores on 50 responses ranged from 30 to 60 minutes, depending upon the problems involved. If the recommended procedure of obtaining independent samples on three different days is followed, the time factor must be increased by a multiple of three. Disregarding considerations of the value of this information for research, the practical significance of information that has such low observer agreement and requires so much time to evolve is limited as far as school clinicians are concerned.

Another consideration in school-conducted research is that any time devoted to testing that is not an integral part of the instructional program detracts from the amount of special service that the children receive. The children in this population were receiving remedial service, which means that they were being taken from their regular classrooms for special instruction. Extra time from classroom activities becomes critical when children are already scheduled for special instruction. Ordinarily, testing time for research purposes is taken from special instructional periods, but may seriously interfere with the amount of time available for this service. In this case, most of the children were scheduled for special instruction daily, so the testing time was minimal relative to total instructional time. In contrast, the ratio of test time to instructional time for children receiving speech therapy 30 minutes biweekly is large.

Other Activities of the Research Center

In addition to the projects completed or in progress, informal discussions about specific research projects were held with 11 different clinicians interested in specific projects of their own, two Ph.D. candidates interested in school research, and one college professor. A plan for developing an evaluation of a team approach to therapy was discussed with a group of three clinicians. In some cases rather detailed outlines were prepared and returned to the clinicians. Generally, these conferences were the outgrowth of the Project Director's presence in a particular locality in conjunction with one of the Center's major projects. A tentative prospectus for research was prepared for the consultant in the Florida State Department of Education. A plan for a program of identification audiometry in schools was prepared for an otolaryngologist in the Midwest.

One two-day conference about research possibilities in schools was held with the supervisor of speech and hearing education in the Kansas City, Missouri, schools and a similar conference was held with the assistant superintendent in charge of research and speech and hearing programs in the St. Louis Special Education District.

Two other requests for consultation were received--one from the Midwest, the other from the east coast. Neither of these consultations could be scheduled.

One workshop was conducted for the speech and hearing staff of the Mt. Diablo Unified School District. Had time permitted, it is likely that a series of projects could have been developed in this school district, as well as one or more projects involving the entire staff. An assessment of the effectiveness of public-school therapy for children who stutter was of particular interest to this group due to the recent charges of Sheehan (73) and Sheehan and Martyn (74) about the effects of speech therapy in schools. Another workshop on research in schools was conducted for the Arizona Speech and Hearing Association.

Finally, a symposium on research for school clinicians, which was coordinated by the Project Director, was presented at the ASHA National Convention in November, 1966. The symposium included presentations by five clinicians who had participated in various projects through the Center. Included also were a series of specific outlines, prepared by the Project Director, for research that school clinicians could accomplish either individually or in cooperation with other clinicians in a single school district. The research plans discussed were designed to be compatible with the service function of school clinicians. This symposium will be repeated at the annual meeting of the California Speech and Hearing Association in April, 1967.

The role of state speech and hearing association research committees with respect to research in schools was discussed in a meeting of committee members from the Indiana, Kansas, and California associations. Each committee has defined its role differently. The California committee conducts research. The Indiana group plans to send representatives to various area meetings conducted by the

Indiana State Department of Education in order to learn about the research interests of school clinicians and to provide consultation in research design for clinicians wishing to engage in research. In short, their plan constitutes a small-scale model of the present project. Interestingly enough, it was developed without prior knowledge of the activities of the Center. The Kansas group intends to " . . . act as a coordinator and stimulator for the development of research by getting various people together who could then carry out a project." They hope to provide a list of possible consultants for clinicians needing help with research design. They also propose to have a listing of interested personnel who could serve as assistants and provide subjects needed for proposed research. Plans are being developed for continued communication among these and other state association research committees.

Even though the present project will be completed at the end of January, 1967, requests for consultation and workshops continue. Two state departments of education have requested full-scale workshops, and three school districts wish to start new projects.

II. RESEARCH PROJECTS, RESEARCH PROPOSALS AND PROSPECTUSES

This part of the Results chapter includes the research completed and the proposals and prospectuses developed during the process of testing the model for a research center for school clinicians.

The first three research reports concern work undertaken in conjunction with the California Speech and Hearing Association Research Committee. One of the studies has been completed through its first phase only. A summary of the research proposal developed through consultation with the Los Angeles city and county schools has been included. The research in the Novato school system is still in progress. Results to date are reported. The prospectuses for four pilot studies, also still in progress, in the Indianapolis City Schools are described. Finally, two reports of research projects initiated by the Center are included.

A. SUPERVISED SCHOOL EXPERIENCE FOR STUDENT CLINICIANS IN CALIFORNIA*

INTRODUCTION

Supervised clinical practice in schools is an important aspect of professional preparation for those students who intend to work as speech and hearing clinicians in schools. (In some states this experience is variously designated as student teaching or school internship.) The fact that most of the clinicians in this state do work in schools lends further weight to the importance of high standards and a set of minimum requirements common to all training programs. The California Speech and Hearing Association Research Committee, having been charged with the responsibility of studying professional concerns of broad scope, chose this area as one of general significance to the profession.

In California, supervised clinical practice in schools has long been a credential requirement; nonetheless, practices among the various training institutions have varied widely. The new credential, adopted in 1964, specifies 90 clock hours of school experience in addition to 135 clock hours of clinical practice in the college clinic. Previously, the amount of time to be spent in schools was specified in semester units, with the number of clock hours subtended by these units left to the discretion of individual training programs. Except for 37 semester units of professional course work, no other requirements are spelled out in the credential.

A questionnaire was designed to determine the attitudes of college supervisors, clinicians working in schools who supervise student clinicians (hereafter referred to as master clinicians), and former students toward the practices and procedures now used in supervised clinical experience in schools. Results of the survey are intended to form the basis of discussion at a statewide conference to which representatives of the above three groups will be invited. It is hoped that this procedure will result in a set of minimum standards acceptable throughout the state.

METHOD

The Questionnaire

The questionnaire covered the following aspects of practices in supervised clinical experience in schools: amount of time required for this experience, assignment procedures, supervision by college supervisors and master clinicians, qualifications of college supervisors and master clinicians, flexibility of school systems for allowing the student to perform as trained, evaluation procedures used by college supervisors and master clinicians, and written criteria provided by colleges and school districts. Respondents were asked to rate each item by indicating whether they considered current practices with respect to each item to be unsatisfactory, poor, adequate, good, excellent. In addition, the questionnaire also asked for the source of written evaluation criteria. Four questions were addressed to college supervisors only: teaching-load credit for supervising clinical experience in schools, number of students supervised per unit of teaching load, maximum number of units per faculty member, and adequacy of the number of school situations available. The only identifying data requested of respondents was the category to which they belonged (college supervisor, master clinician, former student) and the dates encompassing the function indicated.

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*Results of this survey are the subject of a paper authored by Maryjane Rees and Glenn Smith that has been submitted for publication.

The Sample

Names of 25 college supervisors, 214 master clinicians, and 293 former students were supplied by the directors of 20 colleges and university training programs. Thus, a total of 532 questionnaires were sent out of which 23 (92%) were returned by college supervisors, 107 (50%) by master clinicians, and 152 (52%) by former students. Three questionnaires were returned that could not be tabulated due to failure of the respondents to clearly specify the category in which they should be placed.

No attempt was made to establish a representative sample based on training institutions, since it was not the purpose of the survey to evaluate individual training programs or to attempt to correlate results with particular programs. Thus, some programs may be more heavily represented in the responses than others, because the number of former students varied with the size of the training program.

RESULTS

In order to apply statistical tests, it was necessary to collapse some of the categories. Ratings of unsatisfactory and poor were combined into a single category; ratings of good and excellent were also combined into a single category. The results are reported in terms of these categories, the rationale being that poor and unsatisfactory ratings indicate problem areas in need of improvement, while good and excellent ratings indicate practices or conditions of sufficient quality that attempts at improvement need not be undertaken, at least at the present time. The responses to the questionnaire are shown in Table 11.

A 10%-criterion has been applied to identify problem areas. That is, if more than 10% of any group rated an item as poor-unsatisfactory, that item was regarded as representing an area needing further study. While this criterion may seem harsh, the number of children that will be served by each student who becomes a school clinician is very large. Thus, unsatisfactory training of even one student will be reflected in poor service to many children.

Table 11. Responses of 23 college supervisors, 107 master clinicians, and 152 former students to questions about current practices in supervised clinical practice in schools.

Procedure		College Supervisors		Master Clinicians		Former Students		χ^2	df	P*
Time Allocated to Supervised School Experience										
Poor-Unsatisfactory		2	9%	41	39.5%	38	25%	21.49	4	.001
Adequate		6	26%	41	39.5%	54	35.5%			
Good-Excellent		15	65%	22	21%	60	39.5%			
	Totals	23		104		152				
Assignment Procedures										
Poor-Unsatisfactory		2	9%	28	27%	26	17%	11.98	4	.02
Adequate		9	39%	48	46%	48	32%			
Good-Excellent		12	52%	28	27%	78	51%			
	Totals	23		104		152				
Supervision--College Supervisor										
Poor-Unsatisfactory		5	23%	52	49%	48	32%	18.17	4	.01
Adequate		9	41%	38	36%	35	23%			
Good-Excellent		8	36%	16	15%	69	45%			
	Totals	22		106		152				

Table 11, continued.

Procedure	College Supervisors		Master Clinicians		Former Students		χ^2	df	P*
Supervision--Master Clinician									
Poor-Unsatisfactory	0	0%	7	7%	17	11%	5.16	2**	.10
Adequate	4	17%	24	24%	31	21%			
Good-Excellent	19	83%	69	69%	101	68%			
Totals	23		100		149				
Qualifications--College Supervisors									
Poor-Unsatisfactory	0	0%	9	10%	9	6%	8.47	2**	.02
Adequate	4	18%	26	27%	21	14%			
Good-Excellent	18	82%	61	63%	121	80%			
Totals	22		96		151				
Qualifications--Master Clinicians									
Poor-Unsatisfactory	1	4%	4	4%	14	10%	7.14	4	.20
Adequate	3	13%	28	30%	28	19%			
Good-Excellent	19	83%	63	66%	105	71%			
Totals	23		95		147				

Table 11, continued.

Procedure	College Supervisors		Master Clinicians		Former Students		χ^2	df	P*
Flexibility of Schools for Allowing Student to Perform as Trained									
Poor-Unsatisfactory	2	9%	13	13%	37	25%	8.84	4	.10
Adequate	8	36%	32	31%	39	26%			
Good-Excellent	12	55%	57	56%	74	49%			
Totals	22		102		150				
College Supervisors' Evaluation Procedures									
Poor-Unsatisfactory	2	9%	32	33%	45	30%	25.73	4	.001
Adequate	7	32%	33	35%	36	24%			
Good-Excellent	13	59%	31	32%	68	46%			
Totals	22		96		149				
Master Clinicians' Evaluation Procedures									
Poor-Unsatisfactory	0	0%	13	13%	24	16%	8.41	4	.10
Adequate	3	13%	23	29%	35	24%			
Good-Excellent	20	87%	57	58%	89	60%			
Totals	23		98		148				

Table 11, continued.

Procedure	College Supervisors		Master Clinicians		Former Students		χ^2	df	P*
Written Evaluation Criteria--College									
Poor-Unsatisfactory	1	6%	19	24%	15	13%	7.86	4	.10
Adequate	4	23%	24	31%	42	35%			
Good-Excellent	12	71%	35	45%	62	52%			
Totals	17		78		119				
Written Evaluation Criteria--District									
Poor-Unsatisfactory	2	17%	8	16%	18	24%	1.49	2**	.50
Adequate	2	17%	17	33%	20	27%			
Good-Excellent	8	66%	26	51%	37	49%			
Totals	12		51		75				

*Probability for nearest tabled chi square.
**Comparison of master teachers and student teachers only.

Time

College supervisors, master clinicians, and former students differed in their opinions about the adequacy of the amount of time required of students-in-training for supervised experience in schools. College supervisors felt that the amount of time devoted to this aspect of training was more than satisfactory for the most part. Master clinicians were notably dissatisfied, while former students tended to distribute their ratings more equally over the three categories.

Applying the 10%-criterion, the amount of time devoted to this aspect of students' training is unsatisfactory, since 39.5% of the master clinicians and 25% of the former students rated it poor to unsatisfactory.

Assignment Procedures

College supervisors and former students were reasonably well satisfied with assignment procedures. In contrast, master clinicians used the adequate category most frequently and split the remaining ratings equally between poor-unsatisfactory and good-excellent ratings.

Assignment procedures are a problem area as judged by the percentage of master clinicians (27%) and former students (17%) giving ratings of poor and unsatisfactory.

Supervision

Supervision of Students by College Supervisors. Opinions about college supervision differed significantly. About a fourth of the college supervisors expressed dissatisfaction with the supervision provided by training institutions, while a little over a third of them rated it as good or excellent. Nearly half of the master clinicians thought college supervision was less than adequate; only 15% rated it good-excellent. Former students were less severe in their judgments than master clinicians, but tended to use the poor-unsatisfactory category more than the college supervisors.

These data indicate that supervision by college supervisors is the most unsatisfactory aspect of the supervised school experience of student clinicians--the aspect most in need of improvement. Relatively high percentages of all three groups rated college supervision as poor or unsatisfactory.

Supervision of Students by Master Clinicians. Master clinicians and former students generally agreed in their ratings of supervision by master clinicians. A majority of respondents considered it good or excellent. Though the responses of college supervisors could not be included in the statistical test, college personnel appeared to be even more favorably disposed toward master clinicians' supervision that the other groups.

Criticism was negligible except for 11% of the former students who indicate that it is poor or unsatisfactory. In view of the fact that low ratings from the two other groups are minimal, it is doubtful whether supervision by master clinicians should be regarded as a problem area.

Qualifications

College Supervisors' Qualifications. Master clinicians and former students did not agree in their ratings of the qualifications of college supervisors; however, in this case the difference was primarily in the greater emphasis on the good-excellent ratings given by former students and a greater preference of the master clinicians for the adequate category. Judgments of college supervisors were quite similar to those of former students, though these data were not included in the statistical test because of the distribution of the ratings.

Responses indicate that the qualifications of college supervisors do not constitute a problem area.

Master Clinicians' Qualifications. Qualifications of master clinicians were generally rated good or excellent by a majority of respondents. Here, again, criticism was negligible, indicating that master clinicians' qualifications are entirely satisfactory when judged by the 10%-criterion established for identifying problem areas.

Flexibility of School Programs

Flexibility of school programs as it affects the student clinician's opportunities to perform as trained by his training institution was given similar ratings by all three groups. For the most part, flexibility was rated adequate or better, though dissatisfaction was expressed by significant proportions of the master clinicians and former students; 13% and 25% respectively rated flexibility poor or inadequate.

Flexibility of school programs must be regarded as a problem area in need of further study.

Evaluation

College Supervisors' Evaluation of Students. Differences of opinion were evident in the responses to questions about college supervisors' evaluation practices. Over half of the college personnel regarded their evaluation practices as good or excellent; most of the others in this group rated them as adequate. In contrast, master clinicians distributed their ratings about equally over the three categories. Former students used the good-excellent category more frequently than master clinicians, but less frequently than the college supervisors. They used the adequate category less frequently than the other two groups and the poor-unsatisfactory category to about the same extent as master clinicians.

These data indicate that college supervisors' procedures for evaluating students need to be improved. Though the college group themselves seem to be satisfied, 33% of the master clinicians and 30% of the former students give poor or unsatisfactory ratings to these procedures.

Master Clinicians' Evaluation of Students. Procedures used by master clinicians in evaluating student clinicians' performance were given similar ratings by all three groups. For the most part, these procedures were judged to be better than adequate. Nonetheless, more than 10% of the master clinicians and former students indicated dissatisfaction with these procedures; thus, master clinicians' procedures for evaluating students' performance must be regarded as needing revision.

Written Evaluation Criteria

Written Criteria Provided by the College. Written criteria provided by the college for evaluating student clinicians were given similar ratings by all three groups. About half or more in each group considered these criteria to be good or excellent, though about 30% indicated they are only adequate.

A sufficient number of master clinicians and former students used the poor-unsatisfactory category to indicate a need for improvement of the written criteria provided by the college.

Written Criteria Provided by the District. Master clinicians and former students gave similar ratings to the evaluation criteria provided by districts. About half of each group rated the criteria good or excellent; about a fifth responded with ratings of poor or unsatisfactory. Responses of college supervisors could not be included in the statistical test; nonetheless, their responses followed a pattern similar to those of the master clinicians and former students.

Written evaluation criteria provided by districts must also be regarded as a problem area in the supervised school experience of student clinicians; 17% of the college supervisors (representing only two respondents), 16% of the master clinicians, and 25% of the former students rated the written criteria as poor or unsatisfactory.

Fewer responses were made to questions about written criteria for evaluating student clinicians' performance provided by colleges and districts than to any other items on the questionnaire. The small number of responses may be a function of the fact that written criteria are not always available. In other instances, written criteria are provided by either the college or the district, but not both. Sources of written criteria are shown in Table 12.

Table 12. Number and percentages of college supervisors, master clinicians, and former students reporting sources of written criteria for evaluating student clinicians placed in schools.

Source	College Supervisors		Master Clinicians		Former Students	
	N	%	N	%	N	%
College only	8	35%	50	48%	55	39%
District only	2	8%	11	10%	12	8%
Both	8	35%	35	33%	60	42%
Neither	5	22%	9	9%	15	11%
TOTALS	23		105		142	

CONDITIONS RELATED TO SUPERVISION OF STUDENT CLINICIANS IN SCHOOLS

Teaching Loads of College Supervisors

Most college supervisors received teaching-load credit for supervising student clinicians in schools, though 4 of the 23 reported they receive no credit. When credit was given, it was usually one unit for every two students (47%) or one unit for every three students (29%). Five (24%) of the 17 college supervisors reported supervising four or more students for one unit of credit.

The maximum number of teaching units per faculty member was generally 10 to 12 units as reported by 64% of the group. About a fifth had maximum loads between 13 and 15 units. One reported more than 18 units, while only one had a maximum teaching load of between 6 to 9 units.

The amount of credit given for supervision, the number of students supervised for one unit of credit, and teaching loads may be related to the conditions that produce general dissatisfaction with the supervision provided by college personnel of student clinicians working in the schools.

School Situations Available

The majority (77%) of college respondents said that the number of situations available for supervised clinical practice in schools was good or excellent. Two (9%) felt the number of situations was adequate, while three (14%) said the number of situations was inadequate. Though this latter number is small, nonetheless, a significant number of students could be affected by this situation.

DISCUSSION

Current practices in supervised clinical experience in schools rated good to excellent by more than 50% of the college supervisors, master clinicians, or former students are shown in Table 13. Well over half of the respondents in each of these groups gave good or excellent ratings to evaluation procedures used by master clinicians, supervision by master clinicians, and qualifications of both master clinicians and college supervisors.

The majority of college supervisors and master clinicians agreed in giving high ratings to the written evaluation criteria provided by districts and flexibility of school programs. A majority of college supervisors and former students agreed in giving high ratings to written evaluation criteria provided by colleges and to assignment procedures. Only college supervisors gave a majority of good or excellent ratings to the total amount of time devoted to supervised school experience and to procedures used by college supervisors in evaluating students. Only one item failed to receive good or excellent ratings from a majority of any group--supervision by college supervisors.

Table 13. Current practices in supervised clinical experience in schools rated good-excellent by more than 50% of any group of respondents (college supervisors, master clinicians, former students). Percentages represent the proportion of the responses in the good-excellent category; N represents the number of respondents using the good-excellent category. (The total number of responses varied for each item.)

Practice or Procedure	College Supervisors %	College Supervisors (N)	Master Clinicians %	Master Clinicians (N)	Former Students %	Former Students (N)
Evaluation Procedures--Master Clinicians	87%	(20)	58%	(57)	60%	(89)
Supervision--Master Clinicians	83%	(19)	69%	(69)	68%	(101)
Qualifications--Master Clinicians	83%	(19)	66%	(63)	71%	(105)
Qualifications--College Supervisors	82%	(18)	63%	(61)	80%	(121)
Written Evaluation Criteria--College	71%	(12)			52%	(62)
Written Evaluation Criteria--District	66%	(8)	51%	(26)		
Time Required	65%	(15)				
Evaluation Procedures--College Supervisors	59%	(13)				
Flexibility of School Program	55%	(12)	56%	(57)		
Assignment Procedures	52%	(12)			51%	(78)

Eight of the 11 areas included in the questionnaire are obviously in need of improvement. Practices given poor or unsatisfactory ratings by more than 10% of any group are shown in Table 14. Even though most of the items appearing in this table received high ratings by a majority of one or more of the groups, the practices are considered to warrant further study and possible revision if more than 10% of the respondents in any group indicate dissatisfaction by giving poor or unsatisfactory ratings. Only two items received 10% or fewer ratings of poor or unsatisfactory from all three groups. These items were qualifications of college supervisors and master clinicians.

A significant proportion of all three groups expressed dissatisfaction with supervision by college supervisors and written evaluation criteria provided by school districts. Significant proportions of the master clinicians and former students were dissatisfied with evaluation procedures used by college supervisors, amount of time required for supervised clinical practice in schools, flexibility of school programs for allowing students to perform as trained by the college, assignment procedures, evaluation procedures used by master clinicians, and written evaluation criteria provided by colleges. Using the more-than-10% criterion, only former students were dissatisfied with master clinicians' supervision.

College supervisors were more satisfied with current practices in supervised school experience for student clinicians than the other groups. Master clinicians expressed opinions indicating substantial dissatisfaction with many aspects of this part of the student's training program. Former students agreed with college supervisors in some cases, but were more in accord with the opinions of master clinicians in others.

SUMMARY AND CONCLUSIONS

A total of 23 college supervisors, 107 master clinicians, and 152 former students responded to a questionnaire about current practices in supervised clinical practice in schools for student clinicians. Those aspects of current practices most in need of improvement as indicated by an appreciable number (more than 10%) of dissatisfied respondents--mainly master clinicians and former students--include the following:

1. Supervision by college supervisors.

2. Amount of time devoted to supervised clinical practice in schools.

3. Procedures used by college supervisors for evaluating student clinicians.

4. Flexibility of school programs in allowing students to perform as trained by the training institution.

Table 14. Current practices in supervised clinical experience in schools rated poor-unsatisfactory by more than 10% of college supervisors, master clinicians, and former students responding. Percentages represent the proportion of responses in the poor-unsatisfactory category; N represents the number of respondents using the poor-unsatisfactory category. (The total number of responses varied for each item.)

Practice or Procedure	College Supervisors %	College Supervisors (N)	Master Clinicians %	Master Clinicians (N)	Former Students %	Former Students (N)
Supervision--College Supervisors	23%	(5)	49%	(52)	32%	(48)
Evaluation Procedures--College Supervisors			33%	(32)	30%	(45)
Time Required			39.5%	(41)	25%	(38)
Flexibility of School Programs			13%	(13)	25%	(37)
Written Evaluation Criteria--District	17%	(2)	16%	(8)	24%	(18)
Assignment Procedures			27%	(28)	17%	(26)
Evaluation Procedures--Master Clinicians			13%	(13)	16%	(24)
Written Evaluation Criteria--College			24%	(19)	13%	(15)
Supervision--Master Clinicians					11%	(17)

5. Assignment procedures.

6. Written evaluation criteria provided by the school district.

7. Written evaluation criteria provided by the college.

8. Procedures used by master clinicians for evaluating students.

Only former students were critical of supervision provided by master clinicians. The need for examination of this area is equivocal, since no more than 11% are dissatisfied. Dissatisfaction with the qualifications of college supervisors and master clinicians was negligible indicating that qualifications need not be of immediate concern.

These areas will be the subject of discussion at a statewide conference of college supervisors, master clinicians, and recently graduated student clinicians. It is hoped that a set of minimum requirements for these areas can be evolved from this conference.

Acknowledgement: Special acknowledgement is due Elise Hahn, whose interest in exploring these problems prompted the project. Members of the California Speech and Hearing Association also assisting in this project were Nadine Coates, Richard Flower, Fred Garbee, Roberta Chertner, Elise Hahn, Glenn Smith, Ed Stark, Wesley Wilson, Esther Herbert--Chairman.

This study was partially subsidized by the California Speech and Hearing Association.

B. CALIFORNIA OPINION SURVEY: RECOMMENDATIONS FOR SUPERVISED SCHOOL EXPERIENCE FOR STUDENT CLINICIANS*

As a preliminary step to developing a set of minimum standards for programs of supervised experience in schools for student clinicians, 532 questionnaires were sent to college supervisors, master clinicians in schools, and former students. The mailing list was restricted to individuals who had supervised students who had been students within the past three years. The questionnaire was in two sections. The first section concerned opinions about current practices. The second section asked for requirements and practices that should be a part of an ideal program. The background of the questionnaire and results of opinions about current practices appear in the preceding report. The present discussion is concerned with elements that affect the quality of this kind of program.

RESULTS

These data are based on questionnaires returned by 23 college supervisors, 107 master clinicians, and 152 former students. The number of responses to each question vary; not all respondents answered each question. A chi square test of independence was applied whenever theoretical frequencies were large enough to do so. Cochran's (see Siegel, 75, p. 178) rule that fewer than 20% of the cells should have an expected frequency of less than five and no cell should have an expected frequency of less than one was followed.

Two arbitrary criteria were established to identify requirements that should be included in an ideal program of supervised school experience for student clinicians. These criteria were a) agreement of at least two-thirds of the respondents in each of the three groups (college supervisors, master clinicians, former students) or b) agreement of two-thirds in two of the three groups, providing the test of independence is either nonsignificant or does not reflect a reversal of preference when chi square is significant. Program requirements that met either of these criteria are considered to represent practices that should be adopted. Requirements in various aspects of the programs on which the consensus specified by the criteria did not obtain are considered to require further study before minimum standards for high-quality programs can be specified.

Recommended Schedule

Fall semester is the better time for placing student clinicians in schools.

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*The results of this survey are the subject of a paper authored by Maryjane Rees and Glenn Smith that has been submitted for publication.

Scheduling Matters Needing Further Study

The data indicate that the following topics need further study before minimum requirements can be specified:

A. Total number of clock hours that should be devoted to supervised clinical practice in schools.

B. Number of weeks over which this experience should be distributed.

C. Number of academic units the student should be permitted to carry in addition to the units covering the school assignment.

D. Supervised clinical practice in schools during summer sessions.

Opinions about the total number of clock hours that should be required varied widely within each group. Master clinicians and former students favor 120 or more clock hours, whereas a small majority of college supervisors would require no more than 110 hours. These hours probably should be spread over a period of either 14 or 16 weeks, though many former students would be satisfied with a more concentrated experience, while college supervisors would not. Marked disagreement obtained with respect to the number of academic units that the student should be permitted to carry in addition to those covering his school assignment. The three groups of respondents not only expressed different sets of preferences, but within each group a clear majority did not emerge for a particular number of units.

Apparently scheduling is the most controversial aspect of this part of the student clinician's training. Not only did different groups select different requirements, agreement within each group was small.

The distribution of responses is shown in Table 15.

Recommended Assignment Procedures

Students should be allowed to have some voice in selecting the following:

A. The school system in which he will be placed.

B. The grade levels to which he is assigned.

Assignment Procedures Needing Further Study

No agreement was reached on the following:

A. The student's role in selecting the master clinicians.

Table 15. College supervisors', master clinicians', and former students' responses to questions about scheduling supervised school experience for student clinicians. Number and percentage of responses in each category are shown. Chi squares are shown whenever possible.

Procedure	College Supervisors		Master Clinicians		Former Students		χ^2	df	P*
	N	%	N	%	N	%			
RECOMMENDED Semester Preferred for School Experience									
Fall	8	53%	60	67%	99	74%	3.26	2	.20
Spring	7	47%	29	33%	35	26%			
Totals	15		89		134				
EQUIVOCAL Number of Clock Hours									
90	4	17%	6	6%	21	15%			
100	3	13%	8	8%	11	8%			
110	6	26%	9	9%	17	12%			
120	4	17%	24	24%	38	26%			
More than 120	6	26%	52	53%	57	39%			
Totals	23		99		144				
Number of Weeks									
8	0	0%	5	5%	20	14%			
10	1	5%	2	2%	24	16%			
12	0	0%	19	18%	18	12%			
14	10	45%	16	16%	25	17%			
16	11	50%	61	59%	61	41%			
Totals	22		103		148				
Number of Additional Academic Units									
0	1	4%	19	19%	26	18%	14.89	6**	.05
1-2	0	0%	17	18%	13	9%			
3-4	7	31%	17	18%	41	28%			
5-6	9	39%	31	32%	36	25%			
More than 6	6	26%	13	13%	30	20%			
Totals	23		97		146				

Table 15, continued.

Procedure	College Supervisors		Master Clinicians		Former Students		χ^2	df	P*
	N	%	N	%	N	%			
School Experience During Summer Session									
Yes	11	48%	39	39%	83	56%	7.35	2	.05
No	12	52%	62	61%	65	44%			
Totals	23		101		148				

*Probability for nearest tabled chi square.

**Comparison of master clinicians' and former students' responses only.

B. The amount of time that should elapse between initial contacts with the school and the beginning of the student's experience.

The respondents were about evenly split on whether the student should be allowed to play some part in the selection of his master clinician. Though the statistical test indicates that the opinions of college supervisors do not differ from those of other groups of respondents, the majority of this sample was opposed to allowing the student to have a voice in selecting the master clinician. The time intervals most frequently chosen for appropriate advance notice to schools were 1-4 and 5-8 weeks. The distribution of responses does not show a clear majority favoring a particular time interval.

These data are shown in Table 16.

Recommended Qualifications for College Supervisors

The qualifications of college supervisors should be characterized as follows:

A. College teaching assignment in speech and hearing.

B. ASHA Certificate of Clinical Competence in Speech Pathology.

C. No requirement for ASHA Certificate of Clinical Competence in Audiology.

D. Prior public-school employment in speech and hearing.

As far as the ASHA Certificate of Clinical Competence in Audiology is concerned, the level of agreement met the criteria for recommending that it should not be required. Although the requirement was rejected, significantly different proportions of respondents in the three groups considered it unessential. While well over two-thirds of the college supervisors and master clinicians rejected this requirement, a fairly large group of former students favored it, which may indicate a feeling of inadequate supervision when dealing with acoustically handicapped children.

Qualifications for College Supervisors Needing Further Study

The following qualifications need further study before recommendations can be made:

A. The academic degree requirement.

B. The need for prior full-time clinical experience.

Opinions differed about academic degree requirements. The choice lies between the master's degree and preparation beyond the master's degree, but not including the doctorate. A small majority of the

Table 16. College supervisors', master clinicians', and former students' responses to questions about preferred assignment procedures. Number and percentage of responses in each category are shown. Chi squares are shown whenever possible.

Procedure	College Supervisors		Master Clinicians		Former Students				
	N	%	N	%	N	%	χ^2	df	P*
RECOMMENDED Student Should Have a Part in Selecting									
School System									
Yes	17	74%	90	84%	133	90%	5.01	2	.10
No	6	26%	17	16%	15	10%			
Totals	23		107		148				
Grade Level									
Yes	15	65%	76	73%	130	87%	10.40	2	.01
No	8	35%	28	27%	20	13%			
Totals	23		104		150				
EQUIVOCAL Student Should Have a Part in Selecting Master Clinician									
Yes	8	35%	49	46%	75	52%	2.84	2	.30
No	15	65%	57	54%	68	48%			
Totals	23		106		143				
Advance Notice to Schools									
Number of Weeks									
0	0	0%	1	1%	1	1%			
1-4	8	35%	47	46%	48	34%			
5-8	7	30%	40	40%	68	48%			
9-12	7	30%	12	12%	18	12%			
More than 12	1	5%	1	1%	7	5%			
Totals	23		101		142				

*Probability for nearest tabled chi square.

college supervisors and the preponderance of former students favored making prior full-time clinical experience a requirement for the college supervisor; in contrast, a small majority of the master clinicians regarded this experience as unnecessary.

The responses to questions about qualifications of college supervisors are shown in Table 17.

Recommended Qualifications for Master Clinicians

Qualifications of the master clinicians should include:

A. Three to four years of experience as a school clinician before being assigned to supervise students.

B. No requirement for the ASHA Certificate of Clinical Competence--Audiology.

Qualifications for Master Clinicians Needing Further Study

No consensus was reached on the following:

A. Academic degree requirement.

B. Need for the ASHA Certificate of Clinical Competence--Speech.

A majority of the college supervisors would require master clinicians to hold the master's degree; small majorities of both master clinicians and former students indicated that work beyond the bachelor's, but not attainment of the master's degree, would be satisfactory. Notable differences obtained in opinions expressed by the three groups about the need for clinical certification. A decided majority of the college supervisors would require it, whereas small majorities of both master clinicians and former students reject such a requirement.

Responses are shown in Table 18.

Recommended Practices--Supervision by College Supervisors

Substantial majorities in each of the three groups agreed on the following:

A. Both the college supervisor and the master clinician should be responsible for and "in charge of" the student clinician.

B. The college supervisor should confer with the student each time he visits the school.

C. The college supervisor should confer with the master clinician each time he visits the school.

Table 17. College supervisors', master clinicians', and former students' responses to questions about qualification requirements for college supervisors. Number and percentage of responses in each category are shown. Chi squares are shown whenever possible.

	College Supervisors		Master Clinicians		Former Students				
Procedure	N	%	N	%	N	%	χ^2	df	P*
RECOMMENDED College Teaching Assignment in Speech and Hearing									
Yes	22	96%	101	96%	147	97%			
No	1	4%	4	4%	4	3%			
Totals	23		105		151				
ASHA Certificate of Clinical Competence in Speech Pathology									
Yes	19	83%	67	66%	110	74%	3.30	2	.20
No	4	17%	34	34%	38	26%			
Totals	23		101		148				
ASHA Certificate of Clinical Competence in Audiology									
Yes	2	9%	28	29%	64	44%	14.11	2	.01
No	21	91%	69	71%	80	56%			
Totals	23		97		144				
Prior School Employment in Speech and Hearing									
Yes	15	65%	94	90%	134	90%	12.54	2	.01
No	8	35%	10	10%	15	10%			
Totals	23		104		149				
EQUIVOCAL Academic Degree									
B.A.	1	5%	1	1%	6	4%			
B.A.+	0	0%	6	6%	9	6%			
M.A.	3	13%	32	30%	43	29%			
M.A.+	15	65%	59	56%	72	49%			
Doctorate	4	17%	7	7%	17	12%			
Totals	23		105		147				

Table 17, continued.

Procedure	College Supervisors		Master Clinicians		Former Students		χ^2	df	P*
	N	%	N	%	N	%			
EQUIVOCAL Prior Full-time Clinical Experience									
Yes	13	59%	39	42%	83	70%	16.56	2	.01
No	9	41%	54	58%	36	30%			
Totals	22		93		119				

*Probability for nearest tabled chi square.

Table 18. College supervisors', master clinicians', and former students' responses to questions about qualifications for master clinicians. Number and percentage of responses in each category are shown. Chi squares are shown whenever possible.

	College Supervisors		Master Clinicians		Former Students				
Procedure	N	%	N	%	N	%	χ^2	df	P*
RECOMMENDED Employment in School Speech and Hearing									
Years									
0	0	0%	0	0%	0	0%			
1-2	0	0%	13	12%	18	12%			
3-4	18	78%	68	65%	102	69%			
5-6	3	13%	21	20%	20	14%			
More than 6	2	9%	3	3%	7	5%			
Totals	23		105		147				
ASHA Certificate of Clinical Competence in Audiology									
Yes	1	4%	11	11%	34	24%	9.47	2	.01
No	22	96%	88	89%	109	76%			
Totals	23		99		143				
EQUIVOCAL ASHA Certificate of Clinical Competence in Speech Pathology									
Yes	19	83%	46	46%	69	48%	10.90	2	.01
No	4	17%	55	54%	76	52%			
Totals	23		101		145				
Academic Degree									
B.A.	0	0%	6	6%	10	7%			
B.A.+	6	26%	59	56%	83	56%			
M.A.	14	61%	22	21%	42	28%			
M.A.+	3	13%	18	17%	11	8%			
Doctorate	0	0%	0	0%	2	1%			
Totals	23		105		148				

*Probability for nearest tabled chi square.

Practices Needing Further Study

A. Number of times the college supervisor should observe the student.

B. Number of students to be supervised for each unit of teaching-load credit.

Opinions varied not only among the three groups of respondents, but within each group as well. The data suggest that the ideal number of observations the college supervisor should make lies somewhere between three and six. Half of the college supervisors indicated that one unit of teaching-load credit should be given for supervising two students, while a fourth of them favored one unit for every three students.

Responses are shown in Table 19.

Recommended Evaluation Procedures

Excellent agreement was reached that evaluation procedures should include the following:

A. The college supervisor and master clinician should make independent written evaluations of the student's performance.

B. Written evaluation should be in the form of both a checklist and a narrative.

C. Evaluation should be made orally between the college supervisor and the student; the master clinician and the student; the college supervisor and the master clinician; and the college supervisor, master clinician, and student together.

D. Oral evaluation involving the master clinician and the student should occur weekly.

E. The student should evaluate himself in writing.

F. The student should prepare a written evaluation of his school placement.

Evaluation Procedures Needing Further Study

Agreement was not reached about the following evaluation procedures:

A. The need for written evaluation prepared cooperatively by the college supervisor and master clinician.

B. The frequency of oral evaluations involving the college supervisor and student.

Table 19. College supervisors', master clinicians', and former students' responses to questions about supervision of student clinicians in schools by college supervisors. Number and percentage of responses in each category are shown. Chi squares are shown whenever possible.

	College Supervisors		Master Clinicians		Former Students				
Procedure	N	%	N	%	N	%	χ^2	df	P*
RECOMMENDED Responsibility for and "in Charge of" the Student									
College Supervisor	2	9%	1	1%	8	5%			
Master Clinician	2	9%	12	11%	23	15%			
Both	19	82%	92	88%	120	80%			
Totals	23		105		151				
Visits to the School Should Include									
Conference with the Student									
Yes	23	100%	105	98%	149	99%			
No	0	0%	2	2%	1	1%			
Totals	23		107		150				
Conference with the Master Clinician									
Yes	23	100%	105	99%	146	98%			
No	0	0%	1	1%	3	2%			
Totals	23		106		149				
EQUIVOCAL Number of Visits									
1-2	3	13%	7	7%	6	4%	13.47	6	.05
3-4	12	52%	43	41%	66	45%			
5-6	6	26%	46	44%	44	30%			
More than 6	2	9%	9	8%	31	21%			
Totals	23		105		147				

Table 19, continued.

Procedure	College Supervisors		Master Clinicians		Former Students		χ^2	df	P*
	N	%	N	%	N	%			
EQUIVOCAL									
Number of Students per Teaching-load Unit									
1	1	5%							
2	10	50%							
3	5	25%							
4	3	15%							
More than 4	1	5%							
Total	20								

*Probability for nearest tabled chi square.

C. The frequency of oral evaluations involving the college supervisor and the master clinician.

D. The frequency of oral evaluations involving the college supervisor, master clinician, and student as a group.

A majority of all three of the groups of respondents favored having the college supervisor and master clinician cooperate in preparing written evaluations of the student. More than two-thirds of the college supervisors favored the cooperative report, but the percentage of master clinicians and former students approached but did not reach the two-thirds criterion. Whether oral evaluations between college supervisor and student should occur bimonthly or monthly was not resolved by the data. Similarly, the frequency of oral evaluations between college supervisor and master clinician was somewhat equivocal, though small majorities of each group preferred monthly conferences.

The summary of responses is shown in Table 20.

Recommended Additional Experiences

All groups agreed that the following should be included as a part of the student's school experience:

A. Observing in schools prior to placement.

B. Observing school clinicians in addition to the master clinician assigned.

C. Planning and conducting workshops for classroom teachers.

D. Counseling parents.

E. Keeping cumulative records.

F. Computing average daily attendance.

G. Conferring with classroom teachers and other school personnel.

Experiences Needing Further Study

Though majorities of each of the three groups favored requiring experience in conducting speech improvement lessons in the classroom, these majorities were not sufficiently large to meet the criteria established for making firm recommendations about requirements. Currently, teaching speech improvement in classrooms is not allowable in attendance accounting for reimbursement purposes in California. The responses imply some disagreement with this policy, which is a fairly recent one.

Table 20. College supervisors', master clinicians', and former students' responses to questions about evaluation procedures. Number and percentage of responses in each category are shown. Chi squares are shown whenever possible.

Procedure	College Supervisors		Master Clinicians		Former Students		χ^2	df	p*
	N	%	N	%	N	%			
RECOMMENDED									
Written Evaluation Should be Prepared									
Independently by College Supervisor									
Yes	15	79%	73	89%	105	83%	1.14	2	.70
No	4	21%	9	11%	22	17%			
Totals	19		82		127				
Independently by Master Clinician									
Yes	15	83%	75	90%	106	84%	1.79	2	.50
No	3	17%	8	10%	20	16%			
Totals	18		83		126				
Evaluation Should be in the Form of									
Checklist	0	0%	3	3%	1	1%			
Narrative	3	13%	10	10%	13	9%			
Both	20	87%	87	87%	135	90%			
Totals	23		100		149				
Oral Evaluations Should Take Place Between									
College Supervisor and Student									
Yes	22	100%	94	96%	138	97%			
No	0	0%	4	4%	4	3%			
Totals	22		98		142				
Master Clinician and Student									
Yes	23	100%	95	97%	137	97%			
No	0	0%	3	3%	4	3%			
Totals	23		98		141				

Table 20, continued.

	College Supervisors		Master Clinicians		Former Students				
Procedure	N	%	N	%	N	%	χ^2	df	P*
RECOMMENDED Oral Evaluations Should Take Place Between									
College Supervisor and Master Clinician									
Yes	21	91%	90	95%	115	85%	3.19	2	.30
No	2	9%	5	5%	21	15%			
Totals	23		95		136				
College Supervisor, Master Clinician, and Student Together									
Yes	16	73%	81	84%	119	82%	1.66	2	.50
No	6	27%	15	16%	26	18%			
Totals	22		96		145				
Frequency of Oral Evaluations--Master Clinician and Student									
Weekly	20	87%	89	88%	122	84%			
Bimonthly	0	0%	9	9%	15	10%			
Monthly	3	13%	2	2%	9	6%			
Twice/Semester	0	0%	1	1%	0	0%			
Totals	23		101		146				
Written Self-Evaluation by Student									
Yes	13	68%	68	66%	78	53%	4.57	2	.20
No	6	32%	35	34%	69	47%			
Totals	19		103		147				
Written Evaluation of School Placement by Student									
Yes	16	76%	76	76%	102	71%	.91	2	.70
No	5	24%	24	24%	42	29%			
Totals	21		100		144				

Table 20, continued.

Procedure	College Supervisors		Master Clinicians		Former Students		χ^2	df	P*
	N	%	N	%	N	%			
EQUIVOCAL Written Evaluation Prepared Cooperatively by College Supervisor and Master Clinician									
Yes	13	76%	43	64%	66	61%	1.64	2	.50
No	4	24%	24	36%	43	39%			
Totals	17		67		109				
Frequency of Oral Evaluation									
College Supervisor and Student									
Weekly	2	9%	17	17%	25	17%	6.57	4**	
Bimonthly	10	43%	41	41%	78	52%			
Monthly	11	48%	42	42%	43	29%			
Twice/Semester	0	0%	0	0%	4	2%			
Totals	23		100		150				
College Supervisor, Master Clinician, and Student Together									
Weekly	0	0%	4	4%	5	4%			
Bimonthly	0	0%	9	10%	21	15%			
Monthly	11	58%	46	51%	63	45%			
Twice/Semester	8	42%	32	35%	50	36%			
Totals	19		91		139				
College Supervisor and Master Clinician									
Weekly	0	0%	6	6%	7	5%			
Bimonthly	4	17%	25	24%	41	27%			
Monthly	15	66%	62	60%	86	58%			
Twice/Semester	4	17%	10	10%	15	10%			
Totals	23		103		149				

*Probability for nearest tabled chi square.
**Twice/semester category not included.

Table 21 contains opinions about desirable school experiences for the student clinician in addition to directed therapy.

SUMMARY AND CONCLUSIONS

Twenty-three college supervisors, 107 master clinicians, and 152 former students responded to a questionnaire about characteristics of an ideal program for supervised clinical practice in schools for student clinicians. If two-thirds or more of the respondents in at least two of the three groups agreed or if two-thirds in two of the three groups agreed, providing the test of independence was either nonsignificant or the data did not reflect a reversal of preference when chi square was significant, the characteristic is considered to be one that should be incorporated into an ideal program. If the responses did not meet these criteria, further study is recommended.

On the basis of these data, an ideal program should include the following:

1. Schedules

   Students would be placed in schools during the fall semester.

2. Assignment Procedures

   Students should be allowed to participate in selecting both the school system and grade levels involved.

3. Qualifications of College Supervisors

   The teaching assignment of college supervisors should be in speech and hearing. The ASHA Certificate of Clinical Competence in Speech Pathology should be required, but similar qualifications in audiology are not necessary. College supervisors should have had prior public-school employment in speech and hearing.

4. Qualifications of Master Clinicians

   Master clinicians should have three to four years of prior experience in speech and hearing. The ASHA Certificate of Clinical Competence in Audiology should not be required.

5. Supervision by College Supervisors

   The responsibility for student clinicians should be shared equally by the college supervisor and the master clinician. The college supervisor should confer with both the student and the master clinician each time he visits the school.

Table 21. College supervisors', master clinicians', and former students' responses to questions about school experiences in addition to directed clinical practice. Number and percentage of responses in each category are shown. Chi squares are shown whenever possible.

Experience	College Supervisors		Master Clinicians		Former Students		χ^2	df	P*
	N	%	N	%	N	%			
RECOMMENDED Observation in Schools Prior to School Assignment									
Yes	20	91%	96	92%	135	90%	.39	2	.90
No	2	9%	8	8%	15	10%			
Totals	22		104		150				
Observation of School Clinicians Besides Master Clinician									
Yes	21	91%	101	98%	148	98%			
No	2	9%	2	2%	3	2%			
Totals	23		103		151				
Planning and Conducting Workshops for Classroom Teachers									
Yes	14	67%	60	61%	107	73%	4.03	2	.20
No	7	33%	39	39%	40	27%			
Totals	21		99		147				
Counseling Parents									
Yes	22	96%	99	95%	145	96%			
No	1	4%	5	5%	6	4%			
Totals	23		104		151				
Keeping Cumulative Records									
Yes	23	100%	104	99%	136	90%	10.76	2	.01
No	0	0%	1	1%	15	10%			
Totals	23		105		151				

Table 21, continued.

Experience	College Supervisors N	College Supervisors %	Master Clinicians N	Master Clinicians %	Former Students N	Former Students %	χ^2	df	P*
RECOMMENDED									
Preparing Average Daily Attendance Records									
Yes	22	96%	92	89%	122	81%	4.93	2	.10
No	1	4%	11	11%	28	19%			
Totals	23		103		150				
Conferring with Classroom Teachers and Other School Personnel									
Yes	23	100%	105	100%	147	97%			
No	0	0%	0	0%	4	3%			
Totals	23		105		151				
EQUIVOCAL									
Experience Conducting Speech-Improvement Lessons in Classroom									
Yes	12	55%	58	58%	105	70%	4.77	2	.10
No	10	45%	42	42%	45	30%			
Totals	22		100		150				

*Probability for nearest tabled chi square.

6. Evaluation Procedures

The college supervisor and master clinician should make independent written evaluations of student performance. This evaluation should be in the form of both a checklist and a narrative. Also, oral evaluations should be made in conferences to include the college supervisor and the student; the master clinician and the student; the college supervisor and the master clinician; and the college supervisor, master clinician, and student. Oral evaluations involving the master clinician and the student should occur weekly. The student should prepare a written evaluation of himself and his school placement.

7. School Experiences in Addition to Directed Therapy

Prior to placement for supervised clinical practice, the student should have an opportunity to observe in schools. He should also have an opportunity to observe not only the master clinician but other clinicians as well. His school experience should include planning and conducting workshops for classroom teachers, counseling parents, keeping cumulative records, computing average daily attendance, and conferring with classroom teachers and other school personnel.

A two-thirds agreement, as qualified above, was not reached on the following aspects of supervised school experience; hence, these areas are considered to need further study before an ideal program can be described:

1. Schedules

The total number of clock hours devoted to supervised clinical practice, the number of weeks over which this experience should be spread, and the number of academic units the student should be permitted to carry in addition to the units covering the school assignment need to be determined. In addition, the issue of supervised clinical practice in schools during summer sessions remains polemic.

2. Assignment Procedures

Agreement was not reached on whether the student should be allowed some voice in selecting his master clinician or on the amount of time that schools should be contacted in advance of placing the student.

3. Qualifications of College Supervisors

Both the academic degree requirement and the need for prior full-time clinical experience for college supervisors need to be determined.

4. Qualifications of Master Clinicians

The academic degree requirement and the ASHA Certificate of Clinical Competence in Speech Pathology for master clinicians need further study.

5. Supervision by College Supervisors

No agreement was reached on the number of times the college supervisor should observe the student or the number of students that should be supervised for each unit of teaching-load credit.

6. Evaluation Procedures

The need for a written evaluation prepared cooperatively by the college supervisor and master clinician was not determined. Also in need of further study is the frequency with which oral evaluations should take place between the college supervisor and the student, the college supervisor and the master clinician, and all three as a group.

7. School Experiences in Addition to Directed Clinical Practice

Whether teaching speech improvement in classrooms should be a part of the experience of students is also equivocal.

The above information is intended to serve as a guideline for a working conference of college supervisors, master clinicians, and recently-graduated students, the purpose of which would be to produce a set of minimum standards for a high-quality program of supervised clinical experience in schools.

Acknowledgment: Special acknowledgement is due Elise Hahn, whose interest in exploring these problems prompted the project. Members of the California Speech and Hearing Association also assisting in this project were Nadine Coates, Richard Flower, Fred Garbee, Roberta Ghertner, Elise Hahn, Glenn Smith, Ed Stark, Wesley Wilson, Esther Herbert--Chairman.

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C. RECOMMENDED PREPARATION IN TEST ADMINISTRATION FOR SCHOOL CLINICIANS

INTRODUCTION

The Problem

Adequate diagnosis of oral communication problems of school children depends to a large extent on information obtained from standardized tests. Student clinicians are trained to administer a number of tests in addition to articulation and hearing tests as adjuncts to the assessment process during the course of their clinical training.

Many schools place rather severe limitations on the tests clinicians are permitted to use, even though they have been trained in test administration and test interpretation. These limitations are thought by many to seriously interfere with the clinician's ability to adequately assess the needs of the speech and hearing handicapped children he serves and, consequently, to formulate therapy plans of maximum effectiveness. Test administration is usually the prerogative of guidance departments, and these departments sometimes dictate policies such that the school clinician may not administer even such a test as the Peabody Picture Vocabulary Test--a test that is designed in such a way that it may be administered by classroom teachers.

Other tests such as the Full-Range Picture Vocabulary Test, French Pictorial Test of Intelligence, Illinois Test of Psycholinguistic Ability, Marianne Frostig Developmental Test of Visual Perception, to name but a few, have become of great interest to speech clinicians in the past few years. They are often used in college clinics. If the school clinician is not permitted to use the diagnostic materials that are regarded as necessary or important to diagnosis and therapy planning by speech clinicians in other work settings, the quality of service provided by schools would be inferior through no fault of the school clinician.

To complicate the matter, schools rarely have enough psychologists and psychometrists to administer tests to children referred to them within a reasonable length of time. The school clinician may find himself in the untenable position of being required to provide training for a child with a complex oral communication problem for six months or longer without whatever insights test results may give him.

The issue is not a simple one. Some tests--the Binet, WISC, and Rorschach are examples--require a background and training that school clinicians usually don't have. Other tests may require a background and skills specific to speech pathology and audiology, which psychologists do not have. Nonetheless, some groups of psychologists appear to desire to pre-empt the entire field of testing all psychological aspects of human behavior.

The field of speech pathology has yet to define clearly the limits of the services it is prepared to offer. The consequences of this failure are more noticeable in the school environment than in other work environments in which speech clinicians practice. Thus, it is in the school environment that the issue about which tests speech clinicians may properly administer as an aid in diagnosing children's oral communication skills has become critical.

Purpose

This study was intended to be a preliminary step in an opinion survey that would determine which tests school clinicians have been trained to administer and interpret, which tests they now use, which tests they would like to be able to use, and the restrictions under which they now work as far as test administration is concerned. The first step, then, was to obtain opinions of directors of college and university speech pathology and audiology programs about recommended preparation in administering standardized tests. Responses to this opinion survey would form the basis for compiling a short but comprehensive list of tests for a questionnaire to be sent to school clinicians.

METHOD

A comprehensive listing of standardized tests was prepared from standard reference sources. These tests were grouped according to an accepted system of classification and included in a questionnaire. Space was provided at the end of each group of tests, in which respondents could write in the names of additional tests.

Directions accompanying the questionnaire were as follows:

> The purpose of this survey is to determine which tests you feel are important in the training of individuals who wish to qualify for the new California credential with preparation in the area of speech and hearing handicapped and for the ASHA certificate of clinical competence in speech pathology (as opposed to audiology). These tests should be considered from the standpoint of their importance to the speech and hearing specialist in arriving at a diagnosis on which to base a plan of therapy for the individual.
>
> Please indicate your opinion about these tests by placing a check in the appropriate column. The following statements describe what is meant by each of the headings.

Competency: The speech and hearing specialist should be trained to administer and interpret the test. The training program should provide supervised practice in the administration of the test and require some minimum level of competence in its administration and interpretation.

Familiarity: The training program should impart some information about the test, such as its purpose, when it might be used, the kinds of information it produces, and so forth. Training would not be at the level of developing some standard of competency in its administration.

Administered by Others: The test is important to the speech and hearing specialist, but its administration and interpretation is, in your opinion, the province of some other profession, because of its complexity, the level of training required for its administration and interpretation, or some similar reason. You may feel that some tests should be administered only by psychologists; others may be appropriately administered only by audiologists.

Not Important: This test is not important to the speech and hearing specialist. There are a number of reasons why you might regard a test as unimportant. You may think it inadequate, outdated, irrelevant, or so forth.

No Opinion: A check in this column indicates that you have no opinion about the test.

Blank spaces are provided at the end of each group of tests. Please add other tests that you think are important.

These tests are classified according to the system used by Burros except for the tests listed under Aphasia. These tests are variously classified, but have been grouped together for convenience. Eisenson's test is listed under Character and Personality; Schuell's test is classified as Intelligence-Specifid; the Orzeck and Wepman tests are under English-Speech; the Halstead-Wepman test is not listed; and Myklebust's test is apparently too recent to be shown at all. For convenience, these tests are grouped under Aphasia in this survey.

The chairman of the CSHA Research Committee presented the questionnaire to 18 directors of college and university training programs at the time they were convened during the CSHA annual meeting in 1966. All 18 respondents completed the questionnaire at that time.

Due to space limitations, the 10-page questionnaire itself is not shown. Its format may be inferred from Table 22. The column headings, which have been abbreviated in the table, were spelled out in the questionnaire itself.

RESULTS

Of the 126 tests included in the questionnaire, half or more of the 18 directors of college and university training programs indicated that speech clinicians should be trained to administer and interpret 23 of them at some specified level of competency. Agreement was 100% on two of the tests. These were hearing tests--pure-tone screening and air-conduction threshold tests. Seven of the tests were articulation tests; only one of these tests--the Templin-Darley Tests of Articulation--was designated by 75% or more of the respondents. Agreement was high on all three auditory discrimination tests. Five tests for aphasia were also recommended by 50% or more of the group. Hearing tests designated by 75% or more of the group as those speech clinicians should be trained to administer and interpret included not only the two mentioned previously, but tests for pure-tone bone-conduction thresholds and speech-reception thresholds as well. Discrimination testing (PB) was favored by two-thirds of this group. Two individual intelligence tests--the Peabody Picture Vocabulary Test and the Full-Range Picture Vocabulary Test--and one specific intelligence test--The Illinois Test of Psycholinguistic Abilities--were recommended by 75% or more of the respondents for the competency category. One nonprojective character and personality test--the Vineland Social Maturity Scale--was also indicated by just half of the group. These tests are shown in Table 23 along with the level of agreement reached.

The speech clinician should be familiar with another group of tests--17 in all--according to 50% or more of the respondents. The clinician should not be expected to be competent in administering and interpreting these tests, but should know the purposes of the tests, when they might be used, the kinds of information they produce, and so forth. Four hearing tests were included in this group, one group intelligence test, and five individual intelligence tests. Four tests designated as character and personality tests, one of which is a nonprojective test and three projective tests, were placed in the familiarity category. One vocabulary test, one sensory-motor test, and one motor test were also designated for this category. These tests are shown in Table 24.

Thus, according to these respondents, the speech clinician should be competent in administering and interpreting 23 tests, and should be familiar with 17 additional tests. Based on these responses, the student's training should include some work with at least 40 different tests.

Table 22. Responses of 18 directors of college training programs to a questionnaire about training for and use of tests by speech clinicians. Meaning of column headings: C = Competency, F = Familiarity, O = Administered by Others, NI = Not Important, NO = No Opinion, NM = Not Marked. Numbers in parentheses represent the number of respondents marking two categories for a single test.

TEST	C	F	O	NI	NO	NM
Articulation						
An Integrated Articulation Test for Use with Children with Cerebral Palsy (Irwin)	10	6		1	1	
Arizona Articulation Proficiency Scale	9	3			6	
Laradon Articulation Scale	6	4		1	7	
McDonald Deep Test	10	3			5	
Photo Articulation Test (PAT)	10	4			4	
Speech Articulation Test for Young Children (Mecham)	9	5			4	
Templin-Darley Tests	17	1				
Houston Test for Language Development	8	5			5	
Weidner-Fensch Speech Screening Test	6	2			10	
Irene Poole Blanchard Test	7	5			6	
Auditory Discrimination						
Auditory Discrimination Test (Anderson)	14	4				
Auditory Discrimination Test (Templin)	16	2				
Auditory Discrimination Test (Wepman)	14	4				

Table 22, continued.

TEST	C	F	O	NI	NO	NM
Aphasia						
Examining for Aphasia (Eisenson)	15	3				
Halstead-Wepman Screening Test for Aphasia	16	2				
Language Modalities Test for Aphasia (Wepman and Jones)	13	5				
Minnesota Test for Differential Diagnosis of Aphasia	12	5			1	
Orzeck Aphasia Evaluation	5	5			7	1
Picture Story Language Test (Myklebust)	11	4			2	1
Hearing Tests						
Pure-tone screening	18					
Pure-tone air-conduction threshold	18					
Pure-tone bone-conduction threshold	16	2				
Speech Reception Threshold	14	4				
Discrimination (PB)	13	5				
SAL	4	11	1	1	1	
SISI	4	10	2	1	1	
ABLB	3	9	2	1	3	
Bekesy	4	8	4	1		1
EDR	2	9	3	2	1	1

Table 22, continued.

TEST	C	F	O	NI	NO	NM
Intelligence--Group						
California Tests of Mental Maturity	2	8(1)	(1)5	1	1	
Cattell Culture Fair Intelligence Test (Formerly IPAT)	2	5(1)	(1)7	1	2	
Cattell Intelligence Tests	2	5(1)	(1)7	1	1	1
Chicago Nonverbal Examination		4	3	1	9	1
Davis-Eells Test of General Intelligence		2	4	1	9	2
Henmon-Nelson Tests of Mental Ability		1	5	1	10	1
Lorge-Thorndike Intelligence Tests	1	4	6	1	6	
Kuhlman-Anderson Intelligence Tests	1	7(1)	(1)4	2	2	1
Nonlanguage Multi-Mental Test	1	4(1)	(1)3	1	7	1
Nonverbal Tests (NFER - England and Wales)		2(1)	(1)3	1	10	1
Otis Group Intelligence Scale		5(1)	(1)8	1	2	1
Otis Quick-Scoring Mental Ability Tests	3	6	5	1	2	1
Otis Self-Administering Tests of Mental Ability	2	7	6	1	1	1
Pattern Perception Tests	2	3	3		9	1
Pintner General Ability Tests: Verbal Series	1	6(1)	(1)5		4	1
Progressive Matrices (Raven)	2	3(1)	(1)3		7	2
Purdue Nonlanguage Test	1	5(1)	(1)2		7	2

Table 22, continued.

TEST	C	F	O	NI	NO	NM
Intelligence--Individual						
Arthur Adaptation of the Leiter International Performance Scale	1	9(1)	(1)4	1	2	
Arthur Point Scale of Performance Tests		10(1)	(1)4	1	2	
Cattell Infant Intelligence Scale		8(1)	(1)7	1	1	
Columbia Mental Maturity Scale		10(1)	(1)6	1		
French Pictorial Test of Intelligence	1	0(2)	(1)5	1	8(1)	1
Full-Range Picture Vocabulary Test (Ammons and Ammons)	14	3		1		
Gesell Developmental Schedules	7	6	3	1	1	
Leiter International Performance Scale	1	7(1)	(1)5	1	3	
Merrill-Palmer Scale of Mental Tests	1	4	8	2	3	
Minnesota Preschool Scale	2	4(1)	(1)6	1	4	
Nebraska Test of Learning Aptitude	2	2(1)	(1)6	1	6	
Non-Verbal Intelligence Tests for Deaf and Hearing Subjects (Snijders and Snijders - Oomen)	2	6(1)	(1)2		7	
Ontario School Ability Examination	1	1(1)	(1)3		11	1
Passalong Test: A Performance Test of Intelligence			5		12	1
Peabody Picture Vocabulary Test	15	2	1			
Performance Tests of Intelligence (Drever and Collins)	2		3		12	1
Porteus Maze Test	1	5(1)	(1)6	1	3	1
Revised Stanford-Binet	2	4(2)	(2)8		2	

Table 22, continued.

TEST	C	F	O	NI	NO	NM
Intelligence--Individual (continued)						
Van Alstyne Picture Vocabulary Test	2	2	3		10	1
Wechsler Adult Intelligence Scale	2	7(2)	(2)7			
Wechsler Intelligence Scale for Children	4	5(2)	(2)7			
Intelligence--Specific						
Benton Visual Retention Test	1	5	1	1	9	1
Block-Design Test (Kohs Block-Design)	3	4(1)	(1)7	1	1	1
Christensen-Guilford Fluency Tests	2	1	3		11	1
Illinois Test of Psycholinguistic Abilities	14	2(2)	(2)0			
Knox-Cube Test	1	6	4	1	4	2
Manikin Test	2	3	3	2	7	1
Mare and Foal Formboard		1	4	2	10	1
Marianne Frostig Developmental Test of Visual Perception	3	4(1)	(1)5		4	1
Sequin-Goddard Formboard	1	2	4	1	9	1
Character and Personality--Nonprojective						
Adjustment Inventory (Bell)	1	7(1)	(1)5	1	2	1
California Test of Personality	2	6(1)	(1)7		2	
Children's Embedded Figures Test		1	5		11	1
Detroit Adjustment Inventory		1	4		12	1
Goldstein-Scheerer Tests of Abstract and Concrete Thinking	3	7	5	1	2	
Haggerty-Olson-Wickman Behavior Rating Scales		1	7	1	9	

Table 22, continued.

TEST	C	F	O	NI	NO	NM
Character and Personality--Nonprojective (continued)						
Hunt-Minnesota Test for Organic Brain Damage	1	10	4		3	
IPAT Tests of Personality		4(1)	(1)8		4	1
Memory-for-Designs Test	3	4(1)	(1)6		2	2
Minnesota Multiphasic Personality Inventory	2	7(1)	(1)8			
Personal Adjustment Inventory (Rogers)	1	3(1)	(1)5	1	6	1
Personality Inventory (Bernreuter)	1	5(1)	(1)5	1	4	1
Vineland Social Maturity Scale	9	6	2		1	
Character and Personality--Projective						
Auditory Apperception Test	2	7	3		5	1
Bender-Gestalt Test	4	10(1)	(1)2		1	
Blacky Pictures	(1)1	4	(1)5		6	1
Children's Apperception Test	2	9	3		4	
House-Tree-Person Projective Technique	3	6	3	1	3	2
Kent-Rosanoff Free Association Test	1	2	3	1	10	1
Machover Draw-A-Person Test	5	4(1)	(1)3		4	1
Rorschach		1(2)	(2)14		1	
Rosenzweig Picture-Frustration Test	1	4	7		5	1
Sentence Completion Tests	3	5	5	1	3	1
Szondi Test		2	5	3	7	1

Table 22, continued.

TEST	C	F	O	NI	NO	NM
Character and Personality--Projective (continued)						
Thematic Apperception Test (TAT & Cat)		9(2)	(2)7			
Travis Projective Pictures	3	5	5		3	2
Reading--Readiness						
Gates Reading Readiness	2	4(1)	(1)8	1	2	
Metropolitan Readiness Tests	2	4(1)	(1)7	1	3	
Murphy-Durrell Diagnostic Reading Readiness Test	2	3	7	1	5	
Detroit Reading Readiness*	1					
Reading--General						
Gates Basic Reading Tests	1	3(1)	(1)10	1	2	
Iowa Silent Reading Tests		3	10	1	4	
Monroe's Standardized Silent Reading Tests		2	10	1	5	
Reading--Diagnostic						
Diagnostic Reading Examination for Diagnosis of Special Difficulty in Reading		1	10		7	
Durrell Analysis of Reading Difficulty		2	9	1	6	
Gates Reading Diagnostic Tests		1	11	1	5	
Leavell Analytical Oral Reading Test			10	1	7	
Scholastic Diagnostic Reading Tests	1		10	1	6	

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*Added by one respondent.

Table 22, continued.

TEST	C	F	O	NI	NO	NM
Reading--Oral						
Gilmore Oral Reading Test		2	7		9	
Standardized Oral Reading Paragraphs (Gray)		3	6		9	
Spelling						
Ayer Standardized Spelling Test		1	10		7	
Buckingham Extension of the Ayers Spelling Scale		1	8		8	1
Gates-Russell Spelling Diagnosis Test			9		9	
Lincoln Diagnostic Spelling Tests			9		9	
Vocabulary						
Holborn Vocabulary Test for Young Children	1	9	2		6	
Sentence Vocabulary Scale	1	8	3		6	
Sensory-Motor						
Harris Tests of Lateral Dominance	4	8(1)	(1)1	1	3	
Motor						
Kephart Motor Development Scale	2	8(1)	(1)3		4	
Lincoln-Oseretsky Motor Development Scale	3	6(1)	(1)6		2	
Rail-Walking Test	3	6	3	1	4	1
Trankell's Laterality Tests	2	2	5	1	7	1

Table 23. Tests speech clinicians should be trained to administer and interpret as agreed upon by 50% or more of the 18 directors of college and university training programs.

TESTS	75% or more	67-74%	50-66%
Articulation			
An Integrated Articulation Test for Use with Children with Cerebral Palsy (Irwin)			X
Arizona Articulation Proficiency Scale			X
McDonald Deep Test			X
Photo Articulation Test (PAT)			X
Speech Articulation Test for Young Children (Mecham)			X
Templin-Darley Tests	X		
Auditory Discrimination			
Auditory Discrimination Test (Anderson)	X		
Auditory Discrimination Test (Templin)	X		
Auditory Discrimination Test (Wepman)	X		
Aphasia			
Examining for Aphasia (Eisenson)	X		
Halstead-Wepman Screening Test for Aphasia	X		
Language Modalities Test for Aphasia (Wepman and Jones)		X	
Minnesota Test for Differential Diagnosis of Aphasia		X	
Picture Story Language Test (Myklebust)			X

Table 23, continued.

TESTS	75% or more	67-74%	50-66%
Hearing			
Pure-tone screening	X		
Pure-tone air-conduction threshold	X		
Pure-tone bone-conduction threshold	X		
Speech Reception Threshold	X		
Discrimination (PB)		X	
Intelligence--Individual			
Full-Range Picture Vocabulary Test (Ammons and Ammons)	X		
Peabody Picture Vocabulary Test	X		
Intelligence--Specific			
Illinois Test of Psycholinguistic Abilities	X		
Character and Personality--Nonprojective			
Vineland Social Maturity Scale			X

Table 24. Tests with which speech clinicians should be familiar but not trained to administer and interpret according to 50% or more of the 18 directors of college and university training programs.

Hearing

SAL
SISI
ABLB
EDR

Intelligence--Group

California Tests of Mental Maturity

Intelligence--Individual

Arthur Adaptation of the Leiter International Performance Scale
Arthur Point Scale of Performance Tests
Cattell Infant Intelligence Scale
Columbia Mental Maturity Scale
Wechsler Adult Intelligence Scale

Character and Personality--Nonprojective

Hunt-Minnesota Test for Organic Brain Damage

Character and Personality--Projective

Bender-Gestalt Test
Children's Apperception Test
Thematic Apperception Test (TAT and CAT)

Vocabulary

Holborn Vocabulary Test for Young Children

Sensory-Motor

Harris Tests of Lateral Dominance

Motor

Kephart Motor Development Scale

One of the group intelligence tests, three of the individual intelligence tests, two nonprojective and two projective character and personality tests were designated as those that should be administered by professional personnel other than speech clinicians. In most instances no more than half of the group identified these tests as belonging in the province of other professions. Only the Rorschach was placed in this category by a large percentage of the respondents. Twelve reading and spelling tests were placed in this category.

Few of the tests were judged to be of little or no importance to the speech and hearing clinician. A substantial number of tests were marked No Opinion; presumably this category indicated that the respondents were not familiar with the test. A few respondents did not mark all items. The only test added to the original list was the Detroit Reading Test. The responses in all categories are shown in Table 22.

DISCUSSION

The instructions accompanying the questionnaire indicated that the questions pertained to student speech clinicians being trained to work in schools. The context in which the questionnaire was presented further emphasized that the issue at hand stemmed from practices in school programs. Therefore, the results are surprising in some respects.

Though half or more of the respondents selected six articulation tests, two-thirds or better agreement was reached on only one test. Apparently, the Templin-Darley Tests of Articulation are the most frequently used. These data appear to indicate that no great emphasis is placed on training with a variety of tests. In contrast, considerable emphasis seems to be placed on tests of auditory discrimination, since 75% or more of the respondents indicated that students should be trained to administer all three auditory-discrimination tests.

Judging from the responses, considerable importance was placed on competency in administering and interpreting tests of aphasia used with adults. This result is open to a variety of conjectures.

The emphasis on training for competency in administering and interpreting hearing tests is also surprising. In California, identification audiometry in schools is generally the responsibility of school nurses, who must have a certificate in public-school audiometry. Schools do not have sound environments adequate for bone-conduction threshold tests, nor speech audiometers for administering speech reception threshold and discrimination (PB) tests. Here again, what this pattern of recommended training reflects in the way of a philosophy about the preparation of speech clinicians is open to conjecture. Two possibilities present themselves. In the first place, these results could be interpreted to mean that the clinician's training should not be oriented to limitations of a specific work environment. The second implication is that speech clinicians should have more background in aduiology than is implied by the minimum of six semester units in audiology required for the ASHA Certificate of Clinical Competence in Speech Pathology.

These results also imply wide-spread use of the Ammons and Ammons Full-Range Picture Vocabulary Test, the Peabody Picture Vocabulary Test, and the Illinois Test of Psycholinguistic Abilities. The latter test is one of the more controversial tests as far as professional qualifications for its administration and interpretation are concerned.

A definitive statement of professional responsibility, as defined by these respondents, did not emerge. The categories in which responses were to be placed were intended to be mutually exclusive. That is, if administering and interpreting a test is clearly the responsibility of some other profession, it might be supposed that the test would receive but cursory treatment in the student's training. In contrast, familiarity with the purposes and contents of a test, as well as knowing when it should be used, implies rather thorough treatment in the training program. It was intended that tests placed in this category would be those that a speech clinician might be called upon to use but do not require extended training because of their simplicity.

In some cases, respondents indicated that students should be thoroughly familiar with tests but that other professional personnel should be responsible for administering and interpreting them. In some cases, tests generally conceded to require extensive training were placed in the Familiarity category. Thus, it was not obvious whether the respondents used that category as intended or whether they assumed that any test for which competency was not indicated was automatically the responsibility of others.

SUMMARY AND CONCLUSIONS

A total of 18 directors of college and university speech and hearing programs in California responded to a questionnaire about standardized tests important for speech clinicians wishing to qualify for the new California credential with preparation in the area of the speech and hearing handicapped and the ASHA Certificate of Clinical Competence in Speech Pathology (as opposed to audiology). The questionnaire included 126 tests; only one test was added by respondents to the list prepared. Respondents indicated whether the student should be trained to administer and interpret the test at some specified level of competence or whether his background need not extend beyond familiarity with the purpose and contents of the test. They also indicated which tests should be administered by professional personnel other than speech clinicians and which tests were not important to this field.

A majority of the 18 directors of training programs selected 20 tests that students should be trained to administer and interpret. Included in this group of tests were four articulation tests, three auditory-discrimination tests, five tests for aphasia, five hearing tests, two individual intelligence tests and one specific intelligence test. Three other tests--two articulation tests and one nonprojective character and personality test--were assigned to this category by exactly half of the respondents.

Another group of 17 tests were designated by half or more of the group as those with which the student should be familiar, but not trained to administer and interpret. This group included four hearing tests; one group and five individual intelligence tests; one nonprojective and three projective character and personality tests; one vocabulary, one sensory-motor, and one motor test.

Twenty tests were identified as those that should be administered by other professional personnel. Twelve of the tests were reading tests. Of the remaining eight, only the Rorschach was placed in this category by a high percentage of the respondents.

These data indicate that the training of speech clinicians should include competency or familiarity with some 40 standardized tests. Only 20 or the 126 tests were designated as those that are properly administered by other professional personnel. The fact that only 23 of the tests were identified as those that student speech clinicians should be trained to administer and interpret implies that any of the remaining tests requiring extensive training for their administration and interpretation are considered by this group of respondents to be the responsibility of other professional fields.

Acknowledgment: The California Speech and Hearing Association supplied part of the support for this study. Members of the CSHA Research Committee assisting with the study were Nadine Coates, Richard Flower, Fred Garbee, Roberta Ghertner, Elise Hahn, Glenn Smith, Ed Stark, Esther Herbert--Chairman.

D. CHARACTERISTICS OF PUPILS RECEIVING SPEECH AND HEARING SERVICE IN LOS ANGELES AREA SCHOOLS

INTRODUCTION

The Problem

Questions about the nature of the population that finds its way through the identification and selection process are particularly cogent, since the criteria for establishing caseloads are mainly subjective. Decisions about children's speech deviations remain a matter of the perception of individual clinicians, procedures for such objectivity as may be indigenous to multiple-observer agreement being far too time consuming and, hence, too expensive for school programs.

School clinicians must not only identify those pupils who are in need of service, but must also select from this population those who are most in need of service, since few schools are sufficiently staffed to serve all who qualify. In addition to observable communication skills, the clinician must take into account many other conditions such as the pupil's physical conditions related to speech production, his learning ability and motivation, attitudes of his parents and teachers. The clinician must consider, also, his total caseload, his own special areas of competencies, schedules involving several schools, physical plant utilization, and so forth.

While a great deal of information about the pupils in school caseloads is collected routinely, this information is not retrievable for study purposes because of the lack of uniformity in record-keeping and reporting practices. The amount of information gathered, specific items of information, descriptive terms used, and the format under which information is organized vary markedly from district to district and, sometimes, within a district. Detailed description of caseloads is dependent upon adoption of a set of observations to be made systematically on all pupils in the caseload. Furthermore, this set of observations must be adopted by a sufficiently large number of school districts that the sample represents a variety of programs.

It is necessary to know who is receiving service before attempting to assess the adequacy of the service provided. It is necessary to know what the populations being served by school speech and hearing programs "look like," before it is possible to determine whether discrepancies exist between them and some theoretical version of what they ought to "look like." When national prevalence figures become available, it will be possible to compare the extent to which the caseloads conform to the expected distribution of speech-handicapped children in the population. The results of such a comparison would indicate whether some categories of speech disorders or age groups are being neglected or, conversely, whether some groups are receiving an undue proportion of service.

The fact that case selection is based on the subjective judgment of individual clinicians constitutes a second consideration in describing the population of pupils selected for speech and hearing service. The extent to which clinicians agree in evaluating the various aspects of speech and related behaviors and conditions that form the basis for selection needs to be determined.

Once clinician agreement is established over the array of factors that affect case selection, the next need is to develop criterion tests and training materials based on critical items that depress clinician agreement. With these materials available, any staff of clinicians could be trained to achieve a specified minimum standard in all areas of the evaluation process; hence, quality control over the selection process would be possible. Without this kind of quality control, any given program will reflect the wide range in judgment that is likely to be found among clinicians. Under present conditions, the population being served becomes largely a matter of individual clinician judgment, thereby making it difficult, if not impossible, to assert that some uniformly defined segment of the population of speech and hearing handicapped pupils is being routinely served by programs, or that case selection conforms to established policies.

Review of the Literature

A survey of the literature produced no evidence that detailed descriptions of speech and related behaviors of children in caseloads have been published.

Bingham and others (12, pp. 35-38) reported the composition of caseloads based on responses to a questionnaire. Mean size of caseload was reported by regions. Mean number of children in the average total caseload was reported for nine types of disorders. Concentration of cases was shown by percentages at various grade levels; distribution of types of disorders by grade level was not indicated. The classification system used was multidimensional--some categories referred to the type of expressive disorder (articulation, stuttering), while other categories referred to anatomic, neurophysiologic conditions (cleft palate, cerebral palsy), sensory deficits (hard of hearing), learning ability (mentally retarded), and cultural background (bilingual).

The California caseload study (19) was addressed to the number of children included in caseloads in the state, but did not ascertain the characteristics of the population receiving therapy.

Purposes

The purposes of this study are several. The primary purpose of this study is to produce a body of information that describes in detail the population of speech and hearing handicapped pupils constituting caseloads in school programs. It will answer the question: What are the characteristics, as defined by school clinicians, of the speech and hearing handicapped pupils that are selected for speech and hearing service in schools?

A second purpose is to establish the extent to which school clinicians agree in making the kinds of evaluations used in case selection, as well as the reliability with which these judgments are made.

A third purpose is to identify critical factors that affect variability and to devise instructional material and criterion tests based on these factors in order to reduce variability. The materials would be in a form practical, useable, and feasible in the school environment. They would constitute an instrument for introducing quality control over the case selection process.

The fourth purpose is to compare caseloads selected under current practice with those selected after the criterion tests and training materials have been developed and applied to the same staffs of clinicians, and to compare these data with national prevalence figures at such time as figures from the national prevalence study are available.

Summary

In summary, then, the data descriptive of characteristics of pupils in caseloads in the Los Angeles area would indicate the nature of the population receiving speech and hearing services in schools and would provide data on which to base comparisons of caseloads in school districts in other parts of the country. Given information about the makeup of caseloads, it would be possible to determine, either on a priori grounds or in comparison with prevalence figures, whether some adjustments in case selection or service should be made. Since service must necessarily be formulated in terms of recipients, the efficacy of service provided can be better gauged when such data become available. The data pertaining to clinician agreement would indicate whatever need exists for greater uniformity in the evaluation process. Training materials accompanied by criterion tests would provide the tools for accomplishing a specifiable standard of agreement.

METHOD

The Sample

Case records will be filled out on 25,000 children receiving speech and hearing services (itinerant as opposed to day-class service) in the Los Angeles City Schools and 38 school districts in Los Angeles County. The sample will include all children receiving service in each of these districts in order to maximize the usefulness of the information to the participating districts and to make interdistrict comparisons meaningful. A total of 210 clinicians will participate. Written agreements have been signed by all 39 districts.

Each district will be described in terms of total average daily attendance (ADA), staff size, general socioeconomic and cultural conditions, and policy with respect to case selection.

The Los Angeles area contains over one-and-a-half million children between the ages of 5 and 18 years; its total population is greater than that of 42 of the 50 states of the Union. A nearly complete gamut of cultural, racial, and socioeconomic groups, including isolated rural groups, are represented in this population.

Materials

Data about the characteristics of the children receiving therapy will be obtained from a standard case-record form. Information contained therein represents the minimum amount of information deemed essential by clinicians and supervisors for each child in the caseload. The form is organized so that retrieval of the information is simplified even though machine codes have not been included in order to avoid a cluttered appearance. Essentially, the information recorded in the form is an abstract of a much larger body of information that clinicians might have about children in their caseloads. The form, published by the Los Angeles County Superintendent of Schools Office, is contained in Appendix A.

The form requires information covering 10 broad categories. These categories are further broken down into 48 subdivisions.

Cover Page: Name, Age, Sex, Socioeconomic Status (determined by address).

Part A. Identification: 1. Type of Class, 2. Grade Level, 3. History of Therapy, 4. Test Results (IQ, Reading, and Math Achievement), 5. Case Identification.

Part B. Family Information: 1. Parents in Home, 2. Siblings and Others in Home, 3. Languages Spoken in Home, 4. Speech Problems in Family.

Part C. General Health History: 1. Health History, 2. Medical and Dental Diagnoses, 3. Recommended Referrals, 4. Treatment by Other Professional Personnel.

Part D. Hearing Information: 1. Hearing Status, 2. Hearing Test Results, 3. Amplification.

Part E. Speech Behavior--Spontaneous Speech: 1. Articulation, 2. Dialect, 3. Intelligibility, 4. Fluency, 5. Voice Quality, 6. Pitch, 7. Loudness, 8. Rate, 9. Language.

Part F. Communicative Responsiveness: 1. Responsiveness, 2. Eye Contact.

Part G. Observed Physical Behaviors: 1. Drooling, 2. Undesirable Oral Habits, 3. Facial Grimaces and Tics, 4. Gross Bodily Movements, 5. Hand Usage, 6. Foot Usage, 7. Eye Usage.

Part H. Structure and Function of Speech Mechanism: 1. Lips, 2. Teeth, 3. Tongue, 4. Hard Palate, 5. Soft Palate, 6. Nasal Cavities, 7. Breathing Mechanism.

Part I. Type of Expressive Speech or Language Disorder: 1. Single Disorder, 2. Multiple Disorder: a. Primary, b. Secondary, c. Tertiary.

Part J. Articulation Record.

The form is designed for use over a three-year period. A color code has been established to distinguish usage on the basis of this time period.

The case record uses a unidimensional system of classifying speech disorders. It requires a statement of the characteristics of expressive speech, thereby avoiding the spurious assumption that certain structural, neurophysiologic, sensory, or other conditions describe speech behavior.

Though the record form is designed to be self-explanatory, printed instructions were also published. A copy of the instructions are included in Appendix B. A 16 mm film (kinescope) demonstrating the way in which the form should be filled out is also available through the Los Angeles County Schools Office.

Procedures

Data Collection. Clinicians will complete the record for each child in their caseloads. The records will be sent to a data processing center on a schedule such that records can be returned to the clinician within one week of their receipt. A record will be completed on each new case as it is added to the caseload. Though the maximum caseload at any time in California is 90, a rather extensive turnover is found in some caseloads in the Los Angeles area due to the mobility of the population.

Clinician Agreement and Reliability Studies. Over a period of time, clinician agreement and reliability will be determined for each subsection of the case record involving evaluation. It will be determined in two ways: by the use of films, kinescopes, or tape recordings and during routine assessment of speech and related conditions by the use of a second observer present at the time of assessment.

Kinescopes, films, or tape recordings will be developed for each section of the record requiring observation and evaluation. All participating clinicians will be asked to fill in the sections of the record form appropriate for these samples. Repeated trials with the same stimuli will establish reliability. This evaluation process will take place at area meetings. Since the consultants and the sample of clinicians participating in agreement and reliability studies in the live situation will also make judgments from recorded stimuli, the extent to which agreement and reliability varies between these two situations can be determined.

Consultants, or persons with similar job titles that indicate administrative and supervisorial responsibilities, will be used as a standard against which other reliability measures can be obtained without resorting to filmed or recorded stimuli. Interobserver agreement and reliability among the consultants will be established on Parts E, F, G, H, I, and J of the record form (see Appendix A) during actual examination of children.

Those subsections on which agreement among consultants and reliability is high will immediately become subject to similar studies using a sample of clinicians. These data will be obtained in a situation in which one child is the subject while the clinician and consultant make simultaneous but independent observations. For each subsection of the record, a sample of five clinicians, each evaluating three cases, will be assigned to each consultant for purposes of obtaining these data.

Subsections on which agreement among supervisors is low will be studied and means devised for improving agreement. When the level of agreement is sufficiently high, field samples, using the consultants as the criterion, will be obtained.

Item analysis will indicate those items for which criterion tests and training materials need to be developed. This phase of the project will be emphasized during the second and third year. Consultants from behavioral research laboratories in industry will be used to assist in the development of the instructional aspects of these materials.

A small group of selected clinicians will be used for trials of criterion tests and training materials during the development phase. Workshops involving college personnel and a large group of clinicians will be used for final testing and evaluation of the materials. College personnel will contribute additional data through the trials of the materials with students-in-training.

Data Reduction. The data will be summarized for the entire population of districts as well as for each of the individual districts. Descriptive data about each district will make identification of similar districts in other parts of the country possible so that caseload characteristics can be compared. Caseloads will be described by age, sex, socioeconomic status, and the categories of information in each subsection of the case record.

The data will be displayed in a series of tables and graphs that show the relationship of one variable to each of the other variables. For example, for any age level, distribution by sex, socioeconomic status, academic achievement, intelligence, type of problem, and so forth will be shown.

Statistical tests will be applied to some of the data; for example, it will be of interest to know whether a difference in level of intelligence exists between pupils who stutter and those with articulatory deviations, or between those with single and multiple expressive disorders, or whether the level of intelligence differs for older as opposed to younger children in the caseload. Similar information about academic achievement also will be determined.

Another area of inquiry will be whether some particular observation about communicative responsiveness or physical behaviors is invariably associated with pupils diagnosed as stutterers. Should such an item appear, an additional behavioral criterion would be available for diagnosing stuttering, which is especially difficult in borderline cases due to the need for differentiating between normal and abnormal nonfluency.

Data from agreement and reliability studies will be analyzed according to years of experience. Categories will be as follows: 0, 1, 2-4, 5-9, 10-15, more than 15 years. Two substantial changes in the California credential have been made in the past nine years. Two of the categories are intended to reflect the influence of increased training requirements.

These data will also be subjected to item analysis. Those items that depress agreement or reliability will form the basis for instructional materials intended to minimize disagreement.

Approximate Time Schedule

First Year. During a one-year period the characteristics of pupils in caseloads can be described and reported, including data input, retrieval, and summaries. Studies of clinician agreement and reliability in the areas of articulation, from both phonetic inventories and spontaneous speech, and voice can be completed and the data analyzed. A trial set of instructional materials and criterion tests can be developed for the above and tested. The planning phases for the development of training materials in the areas of language, and laterality assessment can be initiated.

Second and Third Years. During the second and third years, agreement and reliability studies and training materials can be completed.

Fourth Year. At the beginning of the school year, the criterion tests will be used to again assess the level of interclinician agreement. Such training as is necessary to bring it to a specified level will be instituted. Caseload data will again be gathered and reported along with a comparison of the two sets of caseload data. At this time, the caseload data can be compared with national prevalence figures.

Acknowledgment. The principal investigators for the research described in this proposal are Nadine Coates, Consultant in Education of the Speech and Hearing Handicapped, Los Angeles County Superintendent of Schools Office, and Esther L. Herbert, Supervisor, Speech and Hearing, Los Angeles City Unified School District. Printing and film expenses were defrayed by the Los Angeles County Superintendent of Schools Office.

E. A PROCEDURE FOR ASSESSING ORAL COMMUNICATION SKILLS OF KINDERGARTEN CHILDREN

INTRODUCTION

The Problem

In contrast with clinicians in nonschool agencies where intake can be limited, school clinicians must make some kind of accounting for all the children with speech deviations in the system they are hired to serve. Failure to do so creates difficulties in the clinician's relations with other school personnel and with parents. Many children enter kindergarten with varying degrees of oral communication difficulties. Assessment of oral communication skills of kindergarten children is important in order to determine which children need immediate attention. In addition, early assessment is an aid to realistic planning of future programs.

Typical screening procedures do not provide enough information for decisions about these children's need for therapy to be made with confidence. Furthermore, the usual individual diagnostic session is not entirely satisfactory, since the way in which the child is able to communicate with his peers cannot be observed.

On the basis of clinical experience, two kinds of test situations seem desirable for assessment of kindergarten children's oral communication skills: individual testing and observation of the child in a peer group. In developing such a program, the kinds of information that can be gained best in the face-to-face encounter and those that are most appropriate in the group situation must be determined.

The problem, then, is a) to compile a test battery for use in individual testing, b) to develop an objective procedure for observing children as they function in a group, and c) to eliminate redundant items in order to achieve maximum efficiency. Once these aspects of the program are refined, the next problem is to establish interclinician reliability for both parts of the assessment process. Finally, a comparison of recommendations based on the results of individual tests and on observations of groups would indicate whether both situations are, in fact, needed. Through applying research methods to this program, the district will be assured that the final recommendation reflects an efficient assessment procedure. Since interclinician reliability depends partly on the specificity of the criteria being applied, the procedures will be sufficiently explicit after the reliability studies are completed that it can be used by other clinicians with a reasonable expectation of obtaining similar results.

The children are scheduled for one hour following their morning kindergarten sessions on three successive weeks. Parents transport the children to a school designated for this purpose. The children meet in a kindergarten room for their activities. A substitute kindergarten teacher conducts the activities while one clinician observes the children. The children are furnished with large name tags to facilitate identification. The other two clinicians take children from the group for individual testing. Group size is set at 12; thus, a half-hour is available for individual tests for each child.

Children with known conditions such as cleft palate, cerebral palsy, and hearing loss are not included in the testing program. Children with these conditions nearly always require some kind of service, even though it may be only a periodic follow-up.

Tests

The test battery for individual speech examinations are as follows:

1. Peabody Picture Vocabulary Test.
2. The Boston Discrimination Picture Test.
3. The Hejna Developmental Articulation Test.
4. Peripheral oral mechanism examination.
5. A sound imitation test.
6. Tests for auditory memory span using both nonsense syllables and digits.
7. A phonetic synthesis test.
8. Spontaneous speech using the birthday party picture card from the Stanford Binet as the stimulus.

The picture stimulus from the Binet was recommended by the school's director of guidance and special services, who is a psychologist. The children in kindergarten are beyond the age level for which this subtest is applicable. It has the advantage of having guidelines for scoring responses, which were helpful in establishing the rating scale used in the present program.

Group Observations

Observations of children in the group are recorded on a checklist using a code system. The observation list is laid out in 12 columns, each headed with a space in which a child's name can be entered. The list of behaviors to be observed and the code, including the meaning of the rating scales, is shown in Table 25. The observer either circles the appropriate item or writes a number in the blank.

Table 25. Checklist and codes for observations of speech and related behavior of kindergarten children in a group situation.

Checklist and Code	Explanation
ARTIC	ARTICULATION IN SPONTANEOUS SPEECH
+______	+ - normal articulation
	1 - few misarticulations
	2 - many misarticulations
	3 - unintelligible because of misarticulations
FLUENCY	FLUENCY IN SPONTANEOUS SPEECH
+______	+ - fluent
	1 - few nonfluencies
	2 - many nonfluencies
	3 - nonfluencies prohibit communication
COMM B	COMMUNICATIVE BEHAVIOR
1. MAN RES	MANNER OF RESPONSE
+	+ - adequate
Slo	Slo - slow to respond
Mix	Mix - mixture of verbal and gesture response
Ges	Ges - responses all by gesture
Bizar	Bizar - bizarre responses
Irrel	Irrel - irrelevant responses
2. INT REL	INTERPERSONAL RELATIONSHIPS
+	+ - adequate
Re-child	Re-child - relates primarily to other children; ignores the adult
Re-adult	Re-adult - relates primarily to the adult; ignores the other children
No-re	No-re - does not relate
3. ACT ATT	ATTENTIVENESS DURING ACTIVITIES
+_______	+ - adequate
	1 - few inattentive moments
	2 - many inattentive moments
	3 - inattentive; does not attend
LENGTH	LENGTH
+_____	+ - adequate
	1 - brief responses; minimal responses; does not elaborate
	2 - single-word responses
	3 - no verbal response
LINGUIST	LINGUISTIC BEHAVIOR
Enumerat___	Responds with enumerating items in picture, etc.
	+ - Responds with enumerating items in picture, plus some description

Table 25, continued.

Checklist and Code	Explanation
LINGUIST	LINGUISTIC BEHAVIOR (continued)
Descrip____	Responds with description
	— - Responds with description and some enumeration
	+ - Responds with description and some sequencing
Sequen____	Responds with logical sequencing of ideas
	— - Responds with logical sequencing of ideas and some description
Bizar____	Grotesque, absurd responses
Irrel____	Logical responses, but not pertaining to stimulus presented
GRAMMAR	GRAMMAR IN SPONTANEOUS SPEECH
+____	+ - adequate
	1 - few grammatical errors
	2 - many grammatical errors
	3 - speech incomprehensible because of grammatical errors
VOCAB	VOCABULARY IN SPONTANEOUS SPEECH
+ —	+ - adequate
	— - limited vocabulary
PITCH-VOICE	PITCH OF VOICE
+ Hi Lo	+ - normal
	Hi - too high
	Lo - too low
Mon V	Mon - monotonous; no voice inflection
	V - variable pitch; vascillating between too high and too low.
LOUDNESS	LOUDNESS
+ L S	+ - normal
	L - too loud for general conversational situation
	S - too soft for general conversational situation
RATE	RATE
+ Fast	+ - normal
	Fast - too fast
Slow Jerk	Slow - too slow
	Jerk - jerky; arythmetical
QUALITY	QUALITY
+ Harsh	+ - normal
	Harsh - presence of vocal fry; grating; rasping sound
Ho Br	Ho - hoarse; low monotonous pitched voice with intermittent aphonia
	Br - breathy; aspirated voice where smooth, excessive outlet of air is present

Table 25, continued.

Checklist and Code	Explanation
QUALITY Nas Denas	QUALITY (continued) Nas - nasal; nasal resonance Denas - denasality; complete oral emission of air with no nasal resonance
MOTOR GROSS + ______	GROSS MOTOR COORDINATION + - adequate 1 - slight incoordination 2 - marked incoordination 3 - severe incoordination
MOTOR FINE + ______	FINE MOTOR COORDINATION + - adequate 1 - slight incoordination 2 - marked incoordination 3 - severe incoordination
HAND R L A	HANDEDNESS R - right handed L - left handed A - ambidextrous
PHYS BEHAV +______	PHYSICAL BEHAVIOR + - normal 1 - few extraneous or excessive movements while talking 2 - many extraneous or excessive movements while talking 3 - extraneous or excessive movements prohibit child from communicating
ORAL HAB +______	UNDESIRABLE ORAL HABITS + none observed 1 - few instances of thumb sucking, mouth breathing, drooling, chewing, biting, etc. observed 2 - many instances of thumb sucking, mouth breathing, drooling, chewing, biting, etc. observed 3 - thumb sucking, mouth breathing, drooling, chewing, biting, etc. completely interfere with communicative effort
GRIM-TIC +_____	FACIAL GRIMACES AND TICS + - none observed 1 - few grimaces or tics observed 2 - many grimaces or tics observed 3 - grimaces or tics prohibit child from communicating

Table 25, continued.

Checklist and Code	Explanation
BREATHING +______	BREATHING + - normal 1 - few instances of abnormal breathing pattern observed 2 - many instances of abnormal breathing pattern observed 3 - abnormal breathing pattern observed completely interferes with attempt to communicate

Recommendations

Each clinician makes independent recommendations for each child. The clinician observing the group generates recommendations for all 12 children. The other two clinicians make recommendations based on individual examinations.

The categories for recommendations are the following:

1. Needs speech therapy immediately.
2. Should have speech therapy in first grade.
3. May need speech therapy at a later date (i.e., after first grade).
4. No speech problem.

Anyone of these categories can be accompanied by a fifth category--Needs referral for other professional services.

RESULTS

To date, only the first test of interclinician agreement in making group observations has been completed. Each of the three clinicians made independent ratings of 20 aspects of communicative behavior and related conditions based on observing the same group of nine children for one hour for three successive weeks. A total of 164 complete sets of observations resulted.

Overall agreement among the three clinicians was 60%, which is much lower than desirable. Some behaviors or conditions are easier to rate than others. Agreement on various behaviors ranged from 22% to 100%. These data are shown in Table 26.

Gross motor coordination appears to be the most difficult behavior to judge reliably, since agreement was lowest for this item. Length of response, fine motor coordination, and physical behaviors (mannerisms, hyperactivity, and so forth) were subject to very poor agreement also. Agreement on three items--pitch, grimaces and tics, and breathing--was 100%. In each case, all children were rated as normal on these characteristics. Loudness and vocabulary also received satisfactory agreement scores--88% and 83% respectively.

The major problem appears to be agreement on that which constitutes normal behavior. In 40 sets of observations on which disagreement occurred, one or more of the clinicians judged the behavior to be within normal limits, while some other clinician or clinicians judged the behavior to be deviant. Of course, not all of the behaviors and conditions included can be rated as normal or atypical. Items on which most disagreement occurred because of differences in opinions about the range of normal behavior were gross and fine motor coordination and physical behaviors. These three items also received the lowest agreement scores. The other item on which agreement was very

Table 26. Agreement among three clinicians in evaluating 20 aspects of communicative behavior and related conditions of nine kindergarten children in a group situation.

		Evaluation											
Behavior	Clini-cian	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	S-9	No. of Ss	Agreement	
Articulation	C1	1		2		2	2	2	2	1	7	3	43%
	C2	1		2		2	2	2	2	1			
	C3	2		1	1	1	2	2	2	+			
Fluency	C1	+		+		+	+	+	+	+	7	4	57%
	C2	+		+		+	+	+	1	+			
	C3	+		+	+	+	+	1	+	1			
Manner of Response	C1	+	Mix	Mix	Ges	Mix	+	Mix	Mix	Mix	9	3	33%
	C2	+	Mix	+	Mix	Mix	+	Mix	+	Mix			
	C3	+	—	+	Slo	Slo	+	+	+	Mix			
Interpersonal Relationships	C1	+	Re-ad	+	Re-ch	+	+	+	+	+	9	8	89%
	C2	+	Re-ad	+	Re-ch	+	+	+	+	+			
	C3	+	No-res	+	Re-ch	+	+	+	+	+			
Attentiveness during Activities	C1	+	1	+	1	+	+	1	+	2	9	4	44%
	C2	+	2	+	2	+	+	+	+	2			
	C3	+	1	+	1	2	1	1	+	2			
Length of Response	C1	+	3	+	3	2	1	2	+	1	9	3	33%
	C2	+	2	+	2	+	+	1	+	+			
	C3	+	—	+	2	+	+	1	+	+			

Table 26, continued.

Behavior	Clinician	Evaluation S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	S-9	No. of Ss	Agreement	
Linguistic Behaviors	C1	Des		En+	En	En	En+			Des-	6	3	50%
	C2	Des		En+	En	En	Des-	En	En	Des-			
	C3	En+		En+	En	En	Des	En	Des+	En			
Grammar	C1	1		1		1	1	2	2	+	7	4	57%
	C2	1		1		1	1	1	+	+			
	C3	1		+	+	1	1	1	1	+			
Vocabulary	C1	+		+			+	—	+	+	6	5	83%
	C2	+	—	+	—	+	+	+	+	+			
	C3	+		+	+	+	+	—	+	+			
Pitch	C1	+	+	+	+	+	+	+	+	+	8	8	100%
	C2	+	+	+	+	+	+	+	+	+			
	C3	+		+	+	+	+	+	+	+			
Loudness	C1	+	S	+	+	+	+	+	+	+	8	7	88%
	C2	+	S	+	+	+	+	S	+	+			
	C3	+		+	+	+	+	S	+	+			
Rate	C1	+		+	+	+	+	Slo	+	+	8	5	63%
	C2	+		+	+	+	Jerk	+	Jerk	+			
	C3	+		+	+	+	+	+	+	+			
Quality	C1	+	+	+	+	Denas	Ho	+	+	+	8	6	75%
	C2	+	+	+	+	+	Ha	+	+	+			
	C3	+		+	+	+	Ha	+	+	+			

Table 26, continued.

		Evaluation											
Behavior	Clini-cian	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	S-9	No. of Ss	Agreement	
Gross Motor Coordination	C1	+	1	1	+	+	1	1	+	+	9	2	22%
	C2	+	+	1	1	+	1	2	+	+			
	C3	1	+	1	1	1	1	1	1	1			
Fine Motor Coordination	C1	1	1	1	1	1	1	1	1	1	9	3	33%
	C2	+	+	1	1	1	1	2	1	1			
	C3	+	+	+	1	+	1	1	+	1			
Hand Usage	C1	R	R	R	L	R	R	L	R	R	9	5	55%
	C2	R	R	R	R	R	A	L	R	R			
	C3	L	R	R	L	A	R	L	R	R			
Physical Behaviors	C1	+	1	+	1	+	+	+	2	1	9	3	33%
	C2	+	+	+	+	+	+	+	+	+			
	C3	+	+	+	1	2	+	1	1	2			
Oral Habits	C1	1	+	+	1	2	2	2	+	1	9	4	44%
	C2	1	+	+	+	2	2	2	+	1			
	C3	+	+	+	+	1	+	3	+	1			
Grimaces and Tics	C1	+	+	+	+	+	+	+	+	+	9	9	100%
	C2	+	+	+	+	+	+	+	+	+			
	C3	+	+	+	+	+	+	+	+	+			
Breathing	C1	+	+	+	+	+	+	+	+	+	9	9	100%
	C2	+	+	+	+	+	+	+	+	+			
	C3	+	+	+	+	+	+	+	+	+			
									TOTALS		164	98	60%

poor--length of response--was subject to two kinds of disagreement. In three cases, two clinicians rated the behavior as normal; in three cases all agreed that length of response was deviant, but differed about the nature of the deviation.

In 18 sets of observations, the clinicians agreed that the behavior or condition was deviant, but disagreed in rating the extent or nature of the deviation. Thus, using a dichotomous classification of normal versus deviant probably would not have improved overall agreement appreciably. Agreement on articulation, manner of response, and length of response changes significantly when judgments are placed in two categories. Agreement changes from 33% to 86% for articulation and from 33% to 67% for manner and length of response. Changes on attentiveness during activities and oral habits are from 44% to 67% for both. What effect directions to use only two categories have on agreement in these cases is, of course, not known.

Agreement among pairs of observers is shown in Table 27. Overall agreement was similar for the three combinations of clinicians. C1 and C2 agree slightly better than either agree with C3. The clinician designated as C3 has had the most experience in group observation. The other two clinicians had previously administered all individual tests.

DISCUSSION

These results indicate that further study of the reasons for disagreement must be undertaken. Low agreement would probably not be altered by the simple expedient of using two categories, though some shift might occur in the presence of a different set of instructions. The low agreement is not a function of one particular clinician's making judgments that differ from those of the other two or showing a marked tendency to prefer some ratings to others.

If the finer discriminations are necessary for making recommendations, then the meaning of the scales will have to be more rigidly delimited and specific. If more gross categories do not affect the recommendations, then a trial with a different set of instructions needs to be run to determine whether judgments of normal versus deviant reach a satisfactory level of agreement.

In 16 instances, ratings were not recorded. Failure to obtain a complete set of three observations on each characteristic for all children indicates the need to establish some precautions to preclude incomplete records.

SUMMARY AND CONCLUSIONS

A procedure for assessing the oral communication skills of kindergarten children was developed. The procedure employs both individual testing and observing children as they function in a

Table 27. Agreement between pairs of clinicians in evaluating 20 aspects of communicative behavior and related conditions of nine kindergarten children in a group situation.

	C1 - C2			C1 - C3			C2 - C3		
Behavior	Sets	Agreement		Sets	Agreement		Sets	Agreement	
Articulation	7	7	100%	7	3	43%	7	3	43%
Fluency	7	6	86%	7	5	71%	7	4	57%
Manner of Response	9	6	67%	9	3	33%	9	5	55%
Interpersonal Relationships	9	9	100%	9	8	89%	9	8	89%
Attentiveness during Activities	9	6	67%	9	7	78%	9	4	44%
Length of Response	9	3	33%	9	3	33%	9	8	89%
Linguistic Behavior	6	5	83%	6	3	50%	8	4	50%
Grammar	7	6	86%	7	4	57%	7	4	57%
Vocabulary	6	5	83%	6	6	100%	8	6	75%
Pitch	9	9	100%	8	8	100%	8	8	100%
Loudness	9	8	89%	8	7	87%	8	8	100%
Rate	8	5	62%	8	7	87%	8	6	75%
Quality	9	7	78%	8	6	75%	8	8	100%
Gross Motor Coordination	9	6	67%	9	4	44%	9	4	44%
Fine Motor Coordination	9	6	67%	9	4	44%	9	5	55%
Hand Usage	9	7	78%	9	7	78%	9	5	55%
Physical Behaviors	9	5	55%	9	4	44%	9	5	55%
Oral Habits	9	8	89%	9	4	44%	9	4	44%
Grimaces and Tics	9	9	100%	9	9	100%	9	9	100%
Breathing	9	9	100%	9	9	100%	9	9	100%
TOTALS	167	132	79%	164	111	68%	168	117	70%

peer group. The individual test battery requires a half-hour for each child. Observations are scheduled for one hour at weekly intervals for three successive weeks. Children are taken from the group for individual testing.

Interclinician agreement for three clinicians based on three hours of observation of nine children in a group situation is low and ranges from 22% to 100% for 20 aspects of communicative behavior and conditions.

The items on which agreement was lowest are the following:

1. Gross motor coordination - 22%
2. Fine motor coordination - 33%
3. Length of response - 33%
4. Physical behaviors (mannerisms, hyperactivity) - 33%

Behaviors or conditions on which agreement was high are the following:

1. Pitch - 100%
2. Grimaces and tics - 100%
3. Breathing - 100%
4. Loudness - 88%
5. Vocabulary - 83%

Disagreement due to varying opinions about the extent to which a behavior or condition is deviant is less frequent than disagreement due to differences in judgments about whether the behavior or conditions is within normal limits.

Level of agreement between the three possible pairs of clinicians is similar; thus, the low overall agreement is not due to the presence of one clinician who deviates markedly from the other two.

Acknowledgment: Participants in this project are Barbara Hoadley, Barbara Schmidt, and Penelope Wayatt of the Novato Unified School District.

F. PROSPECTUS AND DIRECTIONS FOR A STUDY OF STUTTERING THERAPY

THE PROBLEM

In order to evaluate any method of therapy, the method must be sufficiently explicit that it can be used by other clinicians. To the extent that a method remains subjective, it is impossible to transmit (teach) it to other clinicians or to determine its usefulness for more than the particular clinician using it. It is impossible to determine whether results are due to the method itself or to other behaviors on the part of the clinician not included in the specifications of the method. Research purporting to compare methods, is more likely to be a comparison of clinicians than methods, under these conditions.

Furthermore, methods as typically described are likely to contain activities that have varying degrees of effectiveness in producing the desired terminal behavior or end result. It is also possible to produce cancellation effects such that activities that would have been effective are rendered ineffective or partially effective by other activities. The danger, then, in attempting to evaluate an overall method without first analyzing it step-by-step is that the method may appear to be less effective than it actually is, with the result that it is abandoned prematurely.

The purpose of this study is to furhter objectify the method of stuttering therapy outlined in Stuttering Therapy by Bessie Simpson so that it can be clearly and unequivocally transmitted to other clinicians in preparation for research that will ultimately quantify and analyze results obtained with the method.

PROCEDURE

The following discussion is intended to clarify the procedure for developing and stating behavioral criteria as they pertain to methods research.

Terminal behavior must be specified in behavioral terms; that is, it is necessary to specify what it is that the child should be doing as a result of the therapy. On page 5, in Stuttering Therapy under General Objectives in the Treatment of Stuttering, the first objective is to restore or increase the stutterer's ability to speak normally in any situation. Stated in behavioral terms, this objective says that the terminal behavior--normal fluency--must be described so that anyone can recognize whatever it is that is to be called normal fluency. This is important, since few clinicians agree on what constitutes normal fluency. A good example of behavioral specification (nonfluency in this case) will be found in Davis (1939). The reader may not agree with her definition, but at least there is no mistake about what she labels as a repetition.

Second, the criteria for judging whether terminal behavior has been achieved must be specified. That is, in what situation, or situations, will the child's behavior be observed so that the clinician can tell whether or to what extent the child is doing what he is suppose to do as a result of therapy? To what extent must he do it?

A third principle involves determining the child's present behavior with respect to the desired terminal behavior. In other words, What is the child doing now that is different from the desired terminal behavior? How do you know he is doing it? It is equally important to determine what the child is doing now that is the same as the desired terminal behavior. In this way it is possible to specify exactly how much change is necessary; furthermore, it is unnecessary to waste time teaching him to do things that he already does.

When the desired behaviors that need to be learned have been identified, the next step is to determine how you are going to get him to learn these behaviors. For each individual instructional period, the objectives or goals are established, again in terms of behaviors, and the criteria for judging whether those behaviors have been learned at the end of the instructional period. Needless to say, if the child already has achieved the behaviors that are being taught in a particular instructional period, he will have achieved no learning. Therefore, it is necessary to determine where the child is with respect to the behavior or behaviors being taught in each instructional period in order to maximize instructional efficiency. Preparing Instructional Objectives by R. F. Mager is a useful resource in working out behavioral criteria.

In the present case, each of the therapies in Stuttering Therapy will be broken down into objectives or purposes that are described behaviorally, along with the criteria for judging whether the objectives have been achieved. In some cases the therapies seem to have dual purposes, as, for example, Therapy 1, page 17.

One purpose is to stimulate the child to talk. Several questions need to be clarified. How much or how little talking should be taken as evidence that the child needs to be stimulated to talk? How much talking constitutes evidence that the objective has been achieved? Next, when the criteria for "need to be stimulated to talk" have been established, the means for stimulating talking need to be considered. In Therapy 1, the procedure is already described: a picture and story followed by questions. This is one way in which speech can be stimulated, but in the interest of more efficient attainment of objectives, it is appropriate to ask whether some other means are available for producing even more talking, since that is the stated objective.

A second purpose is to obtain information about the child's home. The kind of information that is desired has been specified. The way in which this information is to be used to aid in accomplishing the desired terminal behavior needs to be clarified. In addition it might be useful to record answers to each of the questions. The kinds of answers given or the patterns of answers, accumulated for enough clients, might, in time, become either diagnostic or predictive measures.

Finally, in Therapy 1, a third objective appears; namely, to teach a coverant (see Application, page 18). A coverant is a mental state used by the client to control his own behavior. For this objective, the clinician needs to be told how to determine whether the coverant has been learned--that is, what the child should be doing as a result of learning this coverant.

Therapies 2 through 5 appear to have as their objective the eliciting of information presumably for use by the clinician. The clinician needs to be told the way in which he should use this information to attain the desired terminal behaviors. How the clinician should evaluate the information and how he should act upon it needs to be specified.

Therapy 6 has as its objective the teaching of the individual to name or describe from memory incidents in which he himself has stuttered. The clinician needs to know how many incidents the child should be able to name that should be considered satisfactory performance in this area of behavior. The test of initial behavior is quite clear in this case; namely, the number of incidents cited in response to the seven questions on page 32. After instruction about recalling incidents of stuttering and assistance in recalling some of them, it might be desirable to determine the amount of learning by repeating the same activities outlined in Therapy 6 at the beginning of the next therapy session. At that time it can be determined the number of incidents that the child will name spontaneously. This procedure could be repeated until he names the number of incidents deemed desirable.

No learning process is independent of the reinforcement used. Therefore, care must be taken that only those behaviors that you wish to strengthen are reinforced. Reinforcement can be either in the form of social approval or extrinsic rewards. For example, without any instruction, suppose you went through questions 1 to 7 on page 32. Suppose, also, you had a device that could be activated out of sight of the child such that anytime he mentioned an incident of stuttering a piece of candy corn would drop into a dish, which would be accessible to him. He quickly learns that he gets a piece of candy corn if he mentions a time when he has stuttered. In short order you would be able to get him to name as many incidents as you desire. In the event that questions 1 to 7 do not elicit any incidents of stuttering, it becomes necessary to shape the behavior. The shaping is described in the paragraph following question 7 on page 32. The assisted response is reinforced so that he learns the kind of behavior that will bring him the reward. The only real difficulty thereafter is finding rewards that are sufficiently reinforcing and to be able to shift them when saturation takes place. A similar result could be obtained with social reinforcement (a smile, a nod, "that's right," and so forth), but probably not as quickly.

The objective for Therapy 8 is learning speech rules. The method for teaching them is analogy and imagery. The procedure is clearly specified. The question here is how to determine when the child has actually learned the rules; that is, how is the clinician to judge that the objective has been successfully accomplished?

In Therapy 9, the objective is again a behavioral one--eye contact while speaking. The measure of initial behavior is whether the child maintains eye contact during the first demonstration. After further instruction and demonstrations, the behavior can again be sampled toward the end of the therapy period. A possible test situation would be leaving the therapy room. The therapist tells the child goodbye and observes the child's eye contact as he says goodbye. It is quite easy to keep count of the number of times that the child makes eye contact in the sample situations set up within the therapy period; furthermore, *this behavior can be measured* readily in subsequent sessions. The clinician needs to be told whether the child must make eye contact every time he speaks or whether some percentage of the time constitutes satisfactory behavior. It might be well to indicate to the clinician, also, the kind of reinforcement that is most effective. The clinician should ask the classroom teacher to reinforce the child's eye-contact behavior and to specify the reinforcement the teacher is to use.

In summary, then, each therapy (lesson) should be set up within the following outline, of which Therapy 9 is an example:

Purpose: Maintain eye contact while speaking.

Final criterion: Child enters speech class and maintains eye contact while greeting the clinician without being asked to demonstrate it.

Initial measure: Greet each child; observe eye contact; record its presence or absence.

Procedure for teaching: See page 39 in Stuttering Therapy.

First test: At the end of the therapy period, tell the child goodbye. Observe presence or absence of eye contact and record.

Actually, the final criterion should probably be expanded. Eye contact might be observed throughout a therapy session or some designated portion of it. If the child maintains eye contact on a specified number of speaking attempts, the behavior could then be said to be established.

As can be seen from the above outline, the sample situation in which the behavior is observed for measuring purposes is that of exchanging amenities. It is possible that a child could be conditioned to maintain eye contact in this specific, rather formalized situation only. Such a contingency should be carefully considered.

IMPLICATIONS FOR FURTHER RESEARCH

The first test of a method, once it is made sufficiently explicit that other clinicians can be certain of following the method in the way intended, is to derive a statement of the effectiveness of the method. One clinician might use it with 8 to 10 clients or several therapists might use it with 5 or 6 clients each.

In stuttering therapy, a major problem is that of obtaining reliable and objective initial and final measures of behavior, since stuttering is variable, not only from situation to situation, but from day to day. Given a listing of the behaviors that constitute fluent speech, along with the situations in which judgments of fluency are to be made and the behaviors that the client manifests initially relative to each of these, it becomes possible to specify rather precisely the amount of change that occurs over any given period of time. If, for example, the therapy is 100% successful in establishing eye contact, but is only 50% successful in achieving speech free from prolongations, it is evident that the method is much better for teaching eye contact than for teaching fluent speech when fluent speech is defined as speech without prolongations. It follows, then, that further exploration of the ways in which prolongations can be eliminated is called for.

This kind of information would also allow the clinician to identify the child who is not learning at the rate that is ordinarily expected. Differences between the poor learners and the good learners can be studied, which, in turn, might indicate criteria for predicting success. It is possible that these data would identify subgroups within ghe category of stuttering such that stutterers with certain characteristics respond well to this method, but stutterers with some different set of characteristics do not respond well. The implications are that either the method needs to be modified for the unsuccessful group or some different method needs to be applied.

Once the expected outcome can be clearly defined, it would be necessary to test the results for a group receiving this treatment against results for an untreated control group. One could also test this method against any other method that is desired.

Preparation for the next phase should begin while specification of the behavioral criteria for each of the therapies outlined in the guide is being developed. It is necessary to be very clear about what you call fluent speech, and the sample situations in which you will observe speech. You might, for example, observe the child on three successive days in the classroom during reading. You might observe the child on alternate days for one week on the playground. You might observe the child in three successive therapy sessions in a group situation of unstructured free play. You might observe the child's speech on alternate days during one week by engaging him in conversation at unexpected times in the hall way (for example, when he arrives for school), or engage him in conversation in the therapy room when only the clinician and the child are present. He might be called to the office twice during one week and engaged in conversation by the principal or the secretary. A parent conference might be scheduled during which the child is present so that his speech in the presence of the mother could be observed. Any number of situations could be contrived to give some variety for observing his speech behavior. These situations or similar situations would again be contrived at the end of therapy so so that a comparison could be made between his initial and his final behavior. A checklist of all of the behaviors to be observed would be prepared for use during each of these sample situations. Ideally, these observations would be made by a clinician other than the clinician treating the child.

In summary, the procedure is first to specify a method so explicitly that any clinician can determine whether he is using it in the way intended. The second step is to determine the results that can be expected with the method by using a relatively small group of subjects. The third step is to test the method against behavioral change found in an untreated control group. The fourth step, is the testing of the method against other treatment methods.

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Acknowledgement: Participants in this study, which is being conducted in the Indianapolis City Schools, are Julia Bates, Marilyn Cable, Jo Harrod, Di Miller, and Bessie Simpson--Chairman.

G. PROSPECTUS AND DIRECTIONS FOR A PILOT STUDY OF THE EFFECTS OF ARTICULATION AND LANGUAGE THERAPY ON READING AND SPELLING SKILLS

THE PROBLEM

Though a number of studies have been conducted in order to determine the relationship between speech problems and other language problems, results from these studies remain inconclusive.*

Since clinical observation indicates that some children make remarkable gains in reading and spelling skills as the result of speech therapy and since it seems likely that articulatory difficulties are related to more pervasive language disorders in some, but not all, children, more decisive information should be available when children who have both articulatory and language difficulties are studied.

METHOD

Subjects

Second-grade children and children repeating first grade whose reading is below average and who also have articulatory deviations will constitute the study population. These children will be identified on the basis of the previous year's speech-screening records. Academic records (results of standardized achievement tests and teacher grades) will be used to determine which of the children with speech deviations are also functioning below grade level in reading and spelling skills. Children whose I.Q. score on the Peabody Picture Vocabulary Test is below 80 as well as children with hearing losses will be eliminated from the study population.

Test Materials

Initial tests to be administered by speech clinicians will include the following:

1. Templin-Darley 50-Item Screening Test with additional items for evolving a complete phonetic inventory.
2. A standardized test of silent reading achievement.
3. A standardized test of spelling achievement.
4. A standardized test of arithmetic achievement.
5. The Peabody Picture Vocabulary Test.

Selection of the standardized achievement tests will be made in consultation with the school's research director.

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*A review of the background of the problem was provided. Since it was a condensation of the material discussed in more detail on pages 13-15 it has been omitted here for the sake of brevity. A complete set of references was supplied, but are not shown here for the same reason.

Final tests, administered at the end of the school year, will include the Templin-Darley 50-Item Screening Test and additional items to generate a complete phonetic inventory. Alternate forms of the standardized achievement tests and the Peabody Picture Vocabulary Test will also be administered. In addition to these test results, Metropolitan Readiness ratings, obtained for these children during kindergarten, will be included.

Therapy Method

Therapy procedures will be developed that include not only training in articulatory skills but in the broader spectrum of expressive language skills as well. For example, oral grammar skills, including use of plurals, pronouns, and verb tense, as well as linguistic skills proceeding from naming to description to sequencing will be stressed in conjunction with articulatory skills.

Language skills to be taught will be determined by the group at specified intervals. Each lesson will be completely developed to show objectives defined in terms of behaviors and short tests for determining the status of these behaviors at the beginning and end of each therapy session. Progress of each child toward acquisition of the desired language or speech behavior will be plotted.

For example, in teaching a child to use I instead of me, an activity might be devised to elicit five responses in which I should be used. The number of times that a child uses I correctly in five trials would be recorded. Following instruction through one or more activities, the effectiveness of the instruction is again measured by determining the number of times I is used correctly in a specific number of trials. Given enough of this kind of information, it becomes possible to determine for each of the skills that the child needs to learn how much instruction must be given, how frequently it needs to be repeated, and over what period of time it must be extended. Subsequent reduction in any of these elements indicates greater efficiency.

By pooling results, the group can determine the most efficient procedures and prepare a detailed instructional program sufficiently explicit that it can be used by other clinicians with the expectation that similar results would obtain.

DATA REDUCTION

Difference scores (final test minus initial test) will be derived for each of the standardized achievement tests. Mean amount of improvement on each of the standardized tests will indicate whether improvement in language skills (reading and spelling) are greater than would have been predicted on the basis of previous academic difficulty and Metropolitan Readiness scores. Gains in reading and spelling skills will be compared with gains in arithmetic skills. Since the Peabody Picture Vocabulary Test is more a test of receptive vocabulary than of intelligence, changes in M.A. and I.Q. scores will also be determined.

Correlations will be computed to determine whether the initial Templin-Darley 50-item test scores and phonetic inventory scores are related to amount of gain in the standardized test measures. Additional correlations will be computed to determine whether percentage of terminal articulatory behavior acquired is also correlated with the amount of gain in other areas. Acquisition of terminal behavior is computed as follows: $\frac{\text{final test - initial test}}{\text{total possible - initial test}}$.

IMPLICATIONS FOR FURTHER RESEARCH

Should the data indicate that significant gains relative to age or grade level have been made by the children receiving the combined articulation and language therapy, a controlled study of the effects of this kind of therapy on reading and spelling skills can be introduced the following year. Such a study would involve random assignment of those children who would qualify to one of two groups--one group would receive therapy and the other group would not receive therapy.

An even more ridigly controlled study would be one in which children with articulatory deviations would be matched according to scores from all of the tests used initially. An additional control group, again matched on initial measures, except that this latter group would have no articulatory errors. Each child in the therapy program would then have two matched controls--one with and one without speech deviations, from the same classroom. Such a design is probably impossible in the school situation.

If the data reveal such insignificant gains that the hypothesis that this type of therapy affects other language skills seems unlikely, a more rigidly controlled study would not seem warranted. Results do need to be interpreted liberally, however, since the therapy program being used is in the process of development.

Acknowledgment: Participants in this project, which is being conducted in the Indianapolis City Schools, are Diana Bonham, Jane Gallaway, Jeannie Sands, and Cochairmen Dee Garrett and Stephanie Rahe.

H. PROSPECTUS AND DIRECTIONS FOR A PILOT STUDY OF THE REMISSION OF /r/-ERRORS AMONG FIRST-GRADE CHILDREN

THE PROBLEM

The /r/-sound is considered by many clinicians to be one of the most difficult to correct. It is also a sound that is among those frequently misarticulated by first-grade children. Some children learn correct articulation without formalized instruction; others perseverate articulatory errors in the absence of speech therapy. Case selection in schools remains a problem, since we do not have reliable data on which to base identification of those children who require formal instruction in articulatory skills as opposed to those who will learn correct articulation vicariously. Accurate identification of children who will not learn correct articulation without special help would significantly affect the efficiency of case selection. To the extent that identification can be made accurately, there will be concomitant increase in efficient use of therapists' and children's time, which will be reflected, in turn, in maximizing the effectiveness of funds allocated for the speech program.

The purpose of this study, therefore, is to determine the extent to which children in first grade correct /r/-errors without special help from speech clinicians. Because of the problem of introducing rigid controls into research conducted in the school environment, this study is designed as a pilot study. The study should yield refined hypotheses for subsequent testing under conditions of rigid controls.

PROCEDURE

Subjects

First-grade classes in the schools assigned to the participating clinicians will be screened for articulatory errors. Children who misarticulate /r/ will constitute the study population. Since time is a factor, only those children tested during the regular screening program will be considered for study purposes.

Children who qualify for the study population will undergo a more detailed evaluation. Test instruments will be the Templin-Darley 50-Item Screening Test with some modifications, a complete phonetic inventory, and the picture form of the McDonald Deep Test of Articulation.

Test Materials

In addition to the 50 items on which the Templin-Darley norms are based, a complete phonetic inventory will be included. The phonetic inventory will be derived from items 19 through 43 of the 176-Item Templin-Darley Test. Stimulus items that can be used to produce a shorter test, which includes vowels, are shown in Table 28. Some stimulus items have been changed in order to test consonants as singles rather than in consonantal contexts. Stimuli for blends should be taken from the Templin-Darley screening test. Phonetic elements will be tested in all three positions. The voiceless counterpart of /w/ will not be tested, since it is no longer considered phonemic.

The items from the screening test as well as the stimulus items for eliciting the phonetic inventory will be administered by the repeat-after-me technique, which takes approximately three minutes per child. The use of this technique is based on the assumption that if a child is sufficiently stimulable that the sound is produced correctly after hearing the word once, the sound is included in his articulatory repertoire.

In summary, initial articulation test results will include the stressed and unstressed vocalic /r/, that is, /ɝ/ and /ɚ/; the consonantal /r/ in initial, "medial," and final positions; the double blends /pr/, /br/, /tr/, /dr/, /kr/, /gr/, /fr/, /θr/, /ʃr/; and the triple blends /spr/, /str/, /skr/. Tests results will also include each of the phonetic elements tested in initial, "medial," and final positions as appropriate, except for /hw/, and final /ʒ/.

The Metropolitan-Readiness rating, based on tests administered during kindergarten, will be categorized according to the five classifications of readiness status shown in the publication by Joseph C. Payne (1964, p.5), which is available in your research department.

Additional data will be gathered in order to determine whether remission of /r/-errors without therapy is associated with or can be predicted from other variables. These variables are as follows: sex, age, Metropolitan-Readiness rating, and socioeconomic status.

Age will be computed on the basis of the data at which the test was given minus birthdate.

The approach to socioeconomic background should be determined in consultation with Mr. Payne in accord with the practices of the Indianapolis School District for obtaining and classifying this information. If an accurate statement of the father's occupation is available, the Duncan-Reiss scale is a good one. Socioeconomic status should be recorded according to status at the time of the initial test.

Follow-up tests will be administered in the spring. The dates for these tests should be agreed upon by the group and should be accomplished in a two-week period in order to keep the time elapsing between initial and final tests relatively constant. The follow-up test will include all /r/-items--/ɝ/, /ɚ/, initial, medial, and final /r/, double and triple blends, and the McDonald Deep Test.

Table 28. Adaptation of Templin-Darley Articulation Test for use with the repeat-after-me technique of test administration.

Stimulus Words	Consonants Tested	Vowels Tested
music, lemon, drum	m ___ ___ ___	ju ___
nose, banana, spoon	n ___ ___ ___	oʊ ___ u ___
swinging, ring	ŋ ___ ___	
pencil, sleeping, cup	p ___ ___	ʌ ___
baby, tub	b ___ ___ ___	eɪ ___
toy, eating, boat	t ___ ___ ___	ɔɪ ___
doll, wading, bird	d ___ ___ ___	ɑ ___ ɝ ___
kiss, pocket, book	k ___ ___ ___	ɪ ___ ʊ ___
girl, wagon, dog	g ___ ___ ___	ɔ ___
rabbit, arrow, car	r ___ ___ ___	æ ___
leaf, pillow, bell	l ___ ___ ___	i ___
fence, telephone, knife	f ___ ___ ___	ɛ ___ aɪ ___
valentine, oven, stove	v ___ ___ ___	ə ___
thumb, nothing, teeth	θ ___ ___ ___	
there, feather, smooth	ð ___ ___ ___	
soap, bicycle, mouse	s ___ ___ ___	aʊ ___
zipper, scissors	z ___ ___ ___	ɚ ___
sheep, dishes, fish	ʃ ___ ___ ___	
television, garage	ʒ ___ ___	
horse, grasshopper	h ___ ___	
water, toy watch	w ___ ___	
yellow, onion	j ___ ___	
chair, matches, watch	t ___ ___ ___	
jar, pajamas, bridge	d ___ ___ ___	

DATA REDUCTION

For the purposes of data reduction, errors made in articulating /r/ will be accounted for under the following categories: vocalic, consonantal, double blends, triple blends. For this aspect of the data, the blends will be counted correct if the /r/-element is correct, even though other consonants in the blend may be incorrect.

In arriving at the Templin-Darley 50-Item Screening Test score, the number correct will be used. In this case, blends involving the /r/ will be counted incorrect if any part of the blend is incorrect.

Two other indices of articulation skill will be used. One criterion measure will be the number of errors made on the 50-Item Screening Test minus those errors on /r/ that are included as a part of the 50-Item Test. The second criterion measure will be the number of vowels and consonants misarticulated as singles (that is, not in blends), as determined by the phonetic inventory.

Statistical tests will be applied to determine whether any of the variables are associated with spontaneous remission of /r/-errors, that is, the study population will be categorized into two groups. One group will include all children who no longer misarticulate /r/; the other group will include the children who continue to misarticulate /r/. The groups will be compared to determine whether they differ by sex, age, Metropolitan-Readiness rating, original Templin-Darley 50-Item score, number of Templin-Darley screening items missed other than /r/-errors, and number of errors based on the phonetic inventory, and original Deep-Test score.

If an optical coincidence data-retrieval system is available, the data will be further studied for identification of articulatory patterns associated with the various kinds of /r/-errors and the remission of these errors.

IMPLICATIONS FOR FURTHER RESEARCH

Under conditions of the current project, the population of children is neither a random nor a representative sample of children who misarticulate /r/. The study will establish hypotheses about which the measures are most likely to be related to spontaneous remission of /r/. Those measures that show no relationship can be eliminated, thus reducing the amount of time required for testing. The pilot study may result in observations that suggest other measures.

A rigidly controlled study, which could be conducted next fall, would need to take into account a number of additional considerations. The first is clinician agreement in evaluating articulatory skills. The McDonald Deep Test is especially subject to poor agreement for records on those children who are inconsistent. A second problem is that of clinician reliability--the extent to which the clinician makes the same judgment on repeated trials with the same stimulus. A third problem is reliability of the child's response. That is, assuming an accurate measuring instrument, does the child make the same response to the same stimulus on repeated trials? Inconsistent responses on the McDonald are often variable on repeated tests; that is, the pattern of inconsistency is different from test to test. A fourth difficulty is the sampling adequacy of a single stimulus item per sound, which is the basis for the Templin-Darley test.

A program for determining clinician agreement and reliability along with training to bring agreement and reliability to a satisfactory level would have to be established and completed prior to the beginning of school. The research design itself might include establishing the reliability of children's responses and the extent to which a single stimulus provides an adequate sample of a particular sound in a particular position. Under certain circumstances, these last two considerations could be ignored; however, in attempting to establish predictive criteria, it seems unwise to overlook them.

The population would have to be either a random sample of the children of some specified age or grade level in the school system who misarticulate /r/, or it would have to be the entire population of children with this articulatory error within a specified locale and of a specified age or grade level. The population could be further delimited by ruling out variables such as hearing loss, mental retardation, and so forth. The main consideration is that no selective process can be applied to the subjects once the population has been defined other than random selection. This requirement poses difficulties in the school setting, since parental- and teacher-pressure sometimes obtains when certain children are not given service.

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Acknowledgment: Participants in this project, which is being conducted in the Indianapolis City Schools, are Margo Edmonson, Eileen Maileth, Merna Mosel, and Alice Boyle--Chairman.

I. A PROSPECTUS AND DIRECTIONS FOR A PILOT STUDY OF STIMULABILITY AS A PREDICTOR OF THERAPY SUCCESS WITH /s/-ERRORS

THE PROBLEM

Accurate prediction of success in therapy assists clinicians in selecting caseloads, grouping children for therapy, assessing the number of children who will require therapy for various periods of time, and in determining the extent to which existing staff can provide needed service.

In 1958, Carter and Buck published a report of a prognostic test for first-grade children with functional articulation disorders. They found that stimulability was a good predictor of success in therapy; that the higher the percentage of correction on a nonsense syllable test, the more accurate the prediction for sucessful therapy results (p. 131). Sommers and others (1961) found that the Carter-Buck prognostic test was an excellent predictor of success for children with severe articulatory problems (p. 39). Unfortunately, the average time for administering the test, as determined by six clinicians, was 45 minutes per subject--an amount of time that is impractical in the school situation. In order to be useful to school clinicians, a test of stimulability must be considerably shorter than the Carter-Buck test, which uses words and nonsense syllables.

The simplest and quickest test would be to determine whether the child can produce the sound in isolation after stimulation. A child's ability to produce a sound correctly in isolation is not necessarily a determiner of whether he uses it in words correctly; nonetheless, if a sound can be correctly produced following stimulation, even though it is misarticulated in words, at least the correct sound is available in the child's repertoire of articulatory behaviors, albeit to a limited extent. Producing sounds in isolation is not necessarily easier than producing them in other phonetic contexts. Very young children are usually more willing to attempt producing words than isolated sounds. Words are learned as wholes, not as a series of discrete but connected sounds.

Other considerations make the study of stimulability based on isolated sounds attractive. McDonald (1964) asserts that the context in which a sound appears materially affects its production. Some contexts facilitate correct production of a sound that is otherwise incorrectly articulated, because of the motor patterns involved. Thus, it becomes necessary to sample all of the phonetic contexts in which a sound might appear in order to accurately determine stimulability. Without such a complete sampling, results would be at least partially dependent upon the contexts selected. Here, again, as with the Carter-Buck test, more time is involved than is feasible for routine testing in the school situation.

The use of isolated sounds as a test for stimulability represents the most parsimonious approach--one that requires so little time that it has ready application in the school situation should it prove useful.

PROCEDURE

Subjects

The study will be limited to children with /s/-errors, since /s/ is among the sounds most frequently misarticulated.

Test Materials

After the children who qualify for the study have been identified through the routine screening and referral process, the following tests will be administered:

1. A test of stimulability.
2. Templin-Darley 50-Item Screening Test and additional items for a complete phonetic inventory (see Table 28, p. 178).
3. The McDonald Deep Test of Articulation for /s/ and /z/.

The test for stimulability will be as follows: Three trials will be given for /s/ and three trials for /z/. The sound will be presented three times for each trial. Before each trial is presented, the clinician will make certain that the child is watching him. The following directions will be given:

> I am going to make the /s/-sound. I am going to make it three times. When I am finished, you make it just the way I do--/s-s-s/.

After the child has responded, the directions continue: "Listen, I am going to make /s/ again--/s-s-s/." The directions are repeated for the third trial. The /z/-sound will be presented in exactly the same way as /s/.

No reinforcement will be used after any trial. Responses will be recorded as correct or incorrect for each of the trials. Within each trial two out of three responses must be correct.

The tests will be administered in the order listed above. The Templin-Darley test and phonetic inventory will be administered by the repeat-after-me technique.

The type of /s/-error made by each of the children in the study will be described and classified according to whether they are omissions, substitutions, or distortions. Distortions will be classified as follows: lateral lisp, interdental lisp, occluded lisp, and nasal snort.

Additional descriptive information about the children will include age and sex.

Method

Children will be enrolled for regular therapy, with groups formed from among those who have /s/-errors. Grouping will be homogeneous in the sense that all children in the group will have /s/-errors; type of error will not be used as a criterion for grouping.

At the time the child is judged to have corrected the /s/-errors, the items from the Templin-Darley 50-Item Screening Test that involve /s/, a test for /z/ in initial, medial, and final positions, and the McDonald Deep Test for /s/ and /z/ will be readministered. The number of weeks of therapy received prior to dismissal will be recorded. Children dismissed as corrected prior to the termination of the school year will be retested at the close of the school year with these aforementioned measures in order to determine stability of results. If the child has not corrected the /s/-sound by the end of the school year, the test will be administered at the close of therapy for the year, again with the number of weeks of therapy that the child has received indicated.

DATA REDUCTION

Criterion measures will include the following:

1. Templin-Darley 50-Item Screening Test score.

2. Number of /s/-errors derived from the Templin-Darley 50-Item Screening Test and the phonetic inventory. For this purpose, blends will not be counted as incorrect if the /s/-element is correct, even though some other consonant in the blend is incorrect.

3. Number of errors on /z/ (initial /z/ from the Templin-Darley 50-Item Screening Test and medial and final /z/ from phonetic inventory).

4. Number of errors on the phonetic inventory, not including /s/- and /z/-errors.

5. Inconsistency scores from the Deep Test computed separately for /s/ preceded and followed by consonants and total per cent correct, and similar measures for /z/.

6. Number of trials out of three in which the child produced /s/ and /z/ correctly after stimulation.

Subjects will be divided into three groups according to the results of the test of stimulability on /s/: stimulable, partially stimulable, and not stimulable. A trial will be judged to be correct if at least two of the three responses within the trial are correct.

If only one of the responses within the trial is correct, the trial will be marked incorrect. To be classified as stimulable, each of the three trials must be correct as defined above. To be classified as partially stimulable, either two out of three trials are judged to be correct, or the third (final) trial must be correct. (The criterion of at least two correct responses within a trial applies in all cases.) Children who make errors on all three trials, as well as those who make errors on two of the three trials, except for those who have the last (third) trial correct, will be classified as not stimulable. A similar classification will be made on the basis of stimulability for /z/.

Data for the three groups will be examined to determine whether initial differences exist among them on the following variables: age; sex; type of /s/-error; Templin-Darley 50-Item Test score; number of errors on the phonetic inventory; and consistency of /s/-errors based on number of /s/-errors made on the Templin-Darley test and phonetic inventory, and three measures from the McDonald Deep Test--per cent correct before and after consonants and total per cent correct.

The three groups will also be compared for differences among them on the following variables measured at the end of the school year: number of correct /s/-items from the Templin-Darley 50-Item Screening Test, and the three measures of consistency derived from the McDonald Deep Test. Data for the /z/-sound will be examined in the same way.

In addition to these analyses, the data will be examined also to determine the extent to which /s/-errors are also accompanied by errors on /z/, whether stimulability differs for the two sounds, and whether stimulability is related to the correction of /z/-errors to the same extent that it is for /s/-errors.

IMPLICATIONS FOR FURTHER RESEARCH

The results of this study will indicate whether stimulability as measured by using isolated sounds warrants further study with a larger sample under more controlled conditions. The sample used in the present study cannot be described as either random or representative in a strict sense. Classification of /s/-errors might need to be expanded if the present categories do not adequately cover the most usual deviations. More than three trials might need to be provided in order to have a better measure of stimulability. The need for additional trials can be inferred from the pattern of success with successive trials. Where more than one sound is used, the order of presentation of stimulation trials would need to be randomized.

Measures of interclinician agreement would need to be derived prior to the initial test. If agreement is low, it would have to be brought to an adequate level through additional practice.

Reliability of articulation test results would need to be established. The problem of reliability is particularly cogent as far as the McDonald test is concerned, since some data are available that appear to indicate that a consistent result on the McDonald (all correct or all incorrect) is quite reliable, but that inconsistent results are highly unreliable. That is, the errors made on one trial will not necessarily be the same errors that are made on a second trial.

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J. A STUDY OF COORDINATED RESEARCH

INTRODUCTION

The anticipated difficulties of establishing a large research project necessitating substantial changes in the regular program of one or more school districts have already been discussed (Section I, pp. 41-48). These difficulties suggested the need to explore some alternate procedure and led to the concept of a research center for coordinating research involving a large number of clinicians each of whom would contribute only a small amount of information. It was hypothesized that much-needed answers to some of the important issues pertaining to school therapy programs might be evolved in this way. Disruption to school speech and hearing programs would be minimized. The cost of research under this arrangement would be much less than research conducted in the usual way.

Answers to the following questions would indicate whether such a plan would be worth pursuing.

1. Can meaningful research be designed within the framework of the restrictions of the school environment and the service function of the school clinician?
2. Will school administrators approve research plans developed by an outside agent and allow clinicians in their schools to participate?
3. Are school clinicians interested in research to the extent that they will volunteer to participate?
4. What reasons do school clinicians have for not wishing to participate?
5. Are clinicians who volunteer able to conform to the requirements set by the study? What is the nature of the information returned when they are asked for socioeconomic information about their clients? Will they send in routine attendance reports regularly and adequately filled in?
6. Will clinicians who volunteer continue to completion of the study? For those who do not continue, what are their reasons for having dropped out?
7. What is the attrition in the subject population due to moving, parents requesting that the child be dropped from therapy, receiving service from other agencies, and so forth?
8. What kinds of problems develop in the course of research pursued in this fashion?
9. Can solutions to these problems be evolved?

METHOD

A prospectus for a study was prepared and discussed with supervisors from two county superintendent of schools offices, directors of special services in three large school districts, and an assistant superintendent and the director of research in one other large school district. Permission to pursue the study was granted in all cases.

Meetings with the clinicians in the four districts and two county offices were arranged, and the research was discussed with each of these groups separately. Clinicians who wished to participate contacted the Project Director directly to make the arrangements necessary to begin the study. Participation was limited to those clinicians working in elementary schools and was entirely voluntary.

In order to minimize the interference with the service function and consequent loss of program reimbursement (a critical consideration in this locality), the amount of additional time required of the participating clinicians was kept at two to five hours for the entire study, even though the study covered a period of one year.

It was not the major purpose of this particular study to develop significant conclusions about the speech behavior of the children in the sample. Nonetheless, a study of stimulability as a predictor of success in therapy and inconsistency as a criterion for dismissal was designed. The study was limited to children with /s/ and /r/-errors.

Case selection was not controlled, but depended on whatever criteria the clinician ordinarily used. Clinicians were asked to identify those children who has /s/- or /r/-errors (errors on /r/, /ɝ/, and /ɚ/ were not differentiated) and then to select those children that they would be willing to have work on /s/ or /r/ exclusively until that sound was corrected. The next step was for the clinicians to determine whether suitable groups could be arranged and whether therapy could be provided on the schedule specified. Group size was allowed to vary to a maximum of four. The therapy schedule was 30 minutes twice weekly.

Clinicians also supplied identifying data about the children, which included birthdate, years of previous therapy, and occupation of the children's parents.

Attendance-report forms were prepared by the Center for each of the clinicians' groups. Dates of scheduled therapy were shown; each month's report coincided with the school month for each school district. Thus, clinicians could fill out the report for the Center at the same time they completed their monthly attendance reports. Forms were mailed from the Center one week in advance of the end of the school's report period.

Forty-three clinicians were given an opportunity to participate in the study; 24, or 57%, volunteered. In some cases, scheduling problems interferred with participation. In a few cases, clinicians were assigned so many different schools that they could see children only once a week. In other instances, group sessions were scheduled for 20 minutes rather than 30 minutes. Still other clinicians felt that homogeneous groups were impossible due to restrictions within certain schools such that children from particular classrooms had to be scheduled together in order to avoid objections by classroom teachers. The formula for excess cost reimbursement based on average daily attendance (ADA) works out so that maximum reimbursement depends on scheduling children either individually or in groups of four or more. Excess cost reimbursement does not defray the entire cost of speech and hearing programs. Districts vary in the amount of pressure exerted on clinicians to produce maximum reimbursement; thus, some clinicians needed to maintain group size at four. Some caseloads did not produce four children who qualified for the study and who could be scheduled together. This entire situation is summed up by a respondent who had not been able to participate:

> After wading through the maze of reasons, the conclusion is more simple than I, at first, thought--too large a caseload, too many schools to service, a necessity to be ADA conscious, and not adequate time to group children the way I really would like.

A few clinicians were not interested; a few felt threatened by any deviation from normal routine.

Of the 24 clinicians who volunteered, 21 (88%) continued participating throughout the year. Three clinicians dropped out of the study. Two of the clinicians dropped out almost immediately after the study began; one clinician continued for about five months. In two cases the reasons for dropping out were related to scheduling problems. In one of these cases, a change in school assignment interferred with maintaining the original schedule. In the other case, the grouping proved unsatisfactory and did not serve the best interests of the children involved. No reason can be stated for the third case.

Data relative to socioeconomic status, taken from school records or obtained from children old enough to be competent to report it, was not adequate for analysis. Records turned in for 150 children contained information specific enough to be classified in 81 (54%) instances. Information about parental occupations of 43 children (29%) was too ambiguous to be useful. No information was supplied for parents of 26 (17%) of the children. Parents are not always willing to supply this information to speech clinicians.

The 21 participating clinicians mailed monthly attendance reports. Only three reports (one from each of three clinicians) out of a total of 168 possible reports were missing. No follow-up was made, since it was desired to determine the level of cooperation that could be obtained without supervision. These missing reports could have been readily obtained by a follow-up letter or phone call.

A total of 2,167 biweekly sessions were scheduled during the course of the school year for the 36 groups. The mean number of group sessions was 60.19. The school year is 35 weeks; thus, a total of 70 sessions are theoretically possible, though some time must be spent in screening and diagnostic testing. The number of sessions scheduled for groups ranged from 47 to 68.

During the year, 155 group sessions were cancelled. The mean number of group sessions cancelled was 4.31. The number of cancelled sessions ranged from 0 to 16. Sick leave accounted for the cancellation of 88 sessions (M = 2.44; range = 0-6). Administrative convenience accounted for 67 cancelled sessions (M = 1.86; range = 0-10). Reasons for cancellation for administrative convenience included classroom activities that conflict with the therapy schedule such as field trips, class tests, Christmas programs, and so forth in 31 instances. Parent conferences and staffings accounted for 22 cancellations, while clinicians' attendance at professional meetings accounted for another 10. Reasons for four cancellations were not given.

The mean number of sessions attended by the 92 children was 52.36. These children accounted for 321 absences from school, or a mean of 3.49 sessions missed presumably because of illness. Children's absences from school do not reduce the mean number of sessions attended below 26.

Though an average of 30 weeks of therapy are scheduled in a school year of 35 weeks, these data indicate that only 26 are actually given. Thus, therapy is not available for an average of nine weeks out of the school year. These data are summarized in Table 29. It may be inferred that five weeks are usually spent in the screening at the beginning of the school year, though that figure is probably four, since therapy is often cancelled during the last week of school because activities during that week usually require the child's presence in his classroom.

Attrition in the subject population can be computed in two ways. Total attrition includes those children lost because clinicians dropped out of the study as well as children lost because of moving from the community, transferring to other schools, or extended illness. Another way of computing attrition is to show normal population mobility only. At the beginning of the study, there were 151 subjects; the number remaining after clinicians had dropped out was 131. The number tested in the spring was 113; the number tested the following fall was 103. The data can be summarized as follows:

Table 29. Number of therapy sessions scheduled biweekly and number of sessions cancelled for 36 groups comprised of 92 children assigned to 21 clinicians during one school year (175 teaching days, or 35 weeks).

Sessions	Total	Mean	S.D.	Range
Group sessions scheduled	2167	60.19	4.87	47-68
Group sessions cancelled	155	4.31	2.96	0-16
Group sessions cancelled due to clinician sick leave	88	2.44	1.79	0-6
Group sessions cancelled due to administrative convenience	67	1.86	2.10	0-10
Sessions attended by children	4'817	52.36	7.77	19-64
Sessions missed by children due to absence from school	321	3.49	5.03	0-37

Total Attrition (base = 151)

Fall to spring: 38 (25%)
Fall to fall: 48 (32%)

Normal Population Attrition (base = 131)

Fall to spring: 18 (14%)
Fall to fall: 23 (21%)
Spring to fall: 10 (9%)

Attrition Due to Clinicians: 20 (13%)

As can be seen from these data, attrition was very high in this population. Approximately one-fifth of the subject population was lost due to the normal amount of mobility. Nonetheless, attrition did not alter the ratio of /s/- to /r/-groups significantly. Distribution by sex was remarkably stable as seen in Table 30.

The population obtained appears to be a representative one, even though no attempt was made to control population selection except for the requirements that the children be in elementary school and that they have /s/- or /r/-errors. Descriptive data for the 43 groups as originally established by 24 clinicians are as follows:

/s/-Group

Group size: 2-4
Grade range: 1-6
Age: M = 7.47 years, S.D. = 1.43 years, range = 6.1-11.0 yrs.
Templin-Darley Score: M = 34.76, S.D. = 8.25

/r/-Group

Group size: 2-4
Grade range: 1-6
Age: M = 8.12 years, S.D. = 1.64 years, range = 5.8-12.0 yrs.
Templin-Darley Score: M = 31.44, S.D. = 9.93

DISCUSSION

These results indicate that it is entirely feasible to have a relatively large number of clinicians participate in research by supplying the subject population and providing therapy. This kind of approach seems most useful when response-to-treatment is one of the conditions of the research. Though treatment per se is not controlled, results will indicate that which may be expected generally. Norms derived in this fashion should be stable because of the large number of clinicians that can be used. Since districts employ multiple clinicians, results based on therapy provided by one or two clinicians have little meaning when a school needs to evaluate or plan a program.

Table 30. Attrition in /s/- and /r/-groups.

	Groups	Males	Females	F/M Ratio
/s/-Groups				
Original Subjects	24	52	32	62%
Number after Clinicians Dropped	21	46	28	61%
Tested in Spring	20	39	24	62%
Tested in Fall	20	34	21	62%
Total Attrition		35%	34%	
Normal Population Attrition		26%	25%	
/r/-Groups				
Original Subjects	19	44	23	52%
Number after Clinicians Dropped	16	34	23	68%
Tested in Spring	16	30	20	67%
Tested in Fall	16	29	19	66%
Total Attrition		34%	21%	
Normal Population Attrition		15%	21%	

Administrators are cooperative, providing no budget demands are made and normal service functions are not interrupted. This kind of research can be made attractive to administrators because of the information returned to the school both in terms of test data and in terms of potential increased efficiency. In contrast with other instructional programs in schools, increased efficiency in speech and hearing programs results in palpable reduction of budgetary needs.

Under the most permissive conditions, more than half of the clinicians given the opportunity volunteered to participate; 47% completed their part in the study. Clinician participation could be increased significantly by involving the clinicians in the development of the research proposal and by involving supervisors in some of the administrative details of the research. In short, up to some as yet undetermined point, cooperation improves as the share in the responsibility increases.

Several conditions relating to school programs were brought out by this study. School clinicians are unable to control several aspects of the therapy program. Scheduling and grouping does not necessarily proceed according to the best judgment of the clinician. Rather, he must be responsive to a number of considerations extraneous to the quality of his services. His work is hampered by cancellations due to administrative convenience--field trips, programs, assemblies, and so forth. The number of therapy sessions the children receive is further reduced by failure of schools to provide substitute clinicians when the regular clinician is on sick leave.

As far as research is concerned, these data indicate that the amount of service that is scheduled or that is actually provided during a school year is so variable that designating therapy periods by years or half years is inadequate. Continuity of service within specified weeks or months and actual number of therapy sessions should be a part of the descriptive data when response to treatment is involved.

Attrition in the subject population was higher than anticipated. This study produced objective data indicating that this problem is a serious one for research in which certain kinds of comparisons are desired. However, at least on the basis of this one sample, attrition does not seriously affect distributions within the subject population. The approach used appears to produce populations of the kind desired which are representative of caseloads generally.

One minor problem was encountered in this study that reflects on the potential of this kind of approach; namely, that of attrition among clinicians and a lower percentage of volunteers than might be desired in some cases. The solutions to this problem, which have been inferred from experience with other projects included in this report, have been discussed above.

The major problem of attrition in the subject population due to normal population mobility is not amenable to control other than that of conducting research in areas with low mobility rates. The best antidote for this problem in research when the school population is mobile is to use an approach that minimizes the cost of the necessary inflation of the original population relative to the population needed for drawing conclusions.

The approach tested in this study seems the most reasonable one for this purpose. Its essential element is that it requires so little time in addition to normal service functions that reimbursement for the extra time is not expected. If only a few clinicians were involved, the extra load would be too burdensome. Another important consideration is the expense involved in research for which clinicians are specifically employed. Though in the present study only one group had to be dissolved because of attrition (one child transferred to another school, and two children were dismissed as corrected, leaving only one child still needing therapy) more groups could have been affected. When this happens, the clinician employed only because of research has lost a part of his workload. The cost of service that is, in effect, lost due to attrition is far greater than the cost of a relatively large number of extra tests. The extra tests would have to be given in any event; thus, the double expenditure for service lost and an employee with only a partial workload are avoided under the present arrangement.

SUMMARY AND CONCLUSIONS

In order to test the feasibility of conducting research by enlisting the cooperation of a large number of clinicians of whom active participation would be required, a plan for research was presented to administrators in four school districts and two county schools offices. Following administrators' approval, clinicians employed in these districts or county offices were given an opportunity to participate if they wished to do so. Fifty-seven per cent volunteered; of that group 88% completed the study. Clinicians selected the study population and established groups according to the criteria given. Subjects were tested by research assistants from the Center.

The following conclusions about this kind of approach to research appear justified for this study:

1. School administrators are cooperative if research requires neither expense nor interference with service functions.

2. Clinicians are interested in actively participating in research.

3. Clinicians complete their part of the research extending over a period of one year.

4. Scheduling difficulties prohibit participation of some clinicians.

5. Clinicians supply data regularly; however, socioeconomic data is generally not available to them.

6. The amount of therapy provided in a school year is variable.

    a. The mean number of biweekly sessions scheduled in the school year of 35 weeks was 60.19. The range was 47 to 68.

    b. An average of 4.31 sessions were cancelled for reasons of administrative convenience (class field trips, programs, and so forth) and clinician sick leave. The range of cancelled sessions was 0 to 16.

    c. The mean number of sessions children actually attended was 52.36.

7. Total attrition in the subject population in schools due to moving to other communities, transferring to local schools not in the study, and extended illness is very high.

    a. Total normal attrition was 21%.

    b. Attrition from fall to spring was 14%.

    c. Attrition from spring to fall was 9%.

8. Attrition did not affect distributions within the subject population.

9. Subject populations obtained in this way appear to be normal and representative of caseloads generally.

The percentage of clinicians participating could probably be improved by a more formal working agreement with supervisors and greater involvement of participants in the planning phase of research.

Attrition in the subject population is a serious problem for research in schools. Therefore, a research approach that minimizes the consequences of attrition is highly desirable. The approach described herein appears to qualify as such an approach.

Acknowledgment: School districts participating in this study were Elk Grove, Sacramento City, San Juan, Rio Linda, and Woodland, as well as schools receiving direct service from the superintendent of schools offices in Sacramento and Yolo counties.

K. RELIABILITY OF RANK ORDERS ASSIGNED BY CLASSROOM TEACHERS FOR DETERMINING CHILDREN'S PARTICIPATION IN CLASSROOM DISCUSSION*

The consequences of speech deviations have received relatively little attention as far as research is concerned. Consequences that interfere with learning are of particular importance in the educational setting.

Participation in classroom discussion is assumed to be an important factor in the educational process, since classroom discussion is a standard classroom procedure. It is well known on the basis of clinical observation that a number of children with speech deviations react to their speech problems by being unwilling or relatively unwilling to talk freely. Furthermore, clinical observation indicates that this reaction is progressive; that is, a young child may be willing to speak freely, even though his speech is nearly unintelligible, but as he continues to experience failure in making himself understood, he becomes increasingly unwilling to attempt to communicate. The prevalence of this reaction in a population of children with speech deviations has not been established. If children with speech deviations are low participators and if participation decreases as grade level increases, a number of significant inferences, which would lead to further studies, could be made. However, it is first necessary to find a suitable technique for measuring this behavior.

Rankings by teachers appear to be the most feasible technique. If rank orders are reliable, this technique could be readily used in any school by any clinician. It involves little expense. The alternate technique of introducing a team of trained observers into the classroom to make observations at specified intervals not only introduces an extraneous element into the classroom, but is expensive and time consuming as well.

METHOD

Twenty-seven classroom teachers of grades kindergarten through eight--the entire teaching staff of the Nevada City schools--ranked the children in their classrooms on four characteristics. The teaching arrangement in this school system is such that seventh- and eighth-grade teachers teach all children in the seventh or eighth grades. One class of 32 seventh-grade students and one class of 29 eighth-grade students were selected so these teachers could rank the same children.

Multiple characteristics were used in order to avoid bias and to produce other sets of rankings for comparison. Though the investigator who conducted the sessions with the teachers is a speech and hearing consultant, care was taken to avoid implying that the interest centered around children with speech and hearing problems.

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*The results of this study are the subject of a paper authored by Maryjane Rees and Shirley S. Taylor that has been submitted for publication.

During the first trial, the teachers ranked the children in their classrooms on participation in classroom discussion, creativity, and leadership. At the end of the session, they were told they would be asked to rank the children on academic ability during the next session. During the second trial two weeks later, the teachers first ranked the children on academic ability. When that task was completed, they again ranked the children on participation in classroom discussion and creativity. A third trial in ranking participation in classroom discussion was given one month later, after the purpose of the project had been explained.

The project was introduced during a regular staff meeting as follows:

> As a part of a research project funded by the U. S. Office of Education, you will be asked to make some judgments about certain characteristics of the children in your class. You will make the necessary ratings at the time of the next teachers' meeting on January 11. You will be reimbursed for the extra time that you spend on this task.
>
> The characteristics that we want to know about are amount of participation in classroom discussions, leadership, and creativity. We have no particular definition in mind for these terms except that we want to know how the children function at the present time according to whatever these terms mean to you.
>
> In order to avoid biasing our results, I can't give you any more information at the present time. When the project is completed, it will be explained to you. Perhaps you will want to think about your class in terms of these characteristics during the next week.
>
> Again, in order to avoid biasing the results, please do not discuss this project with each other until it is completed.

Three sets of cards had been prepared for each teacher. Each set was a different color and was packaged separately. Each set contained a card on which the name of each child in that teacher's classroom had been typed along with the characteristic on which the child was to be ranked. The cards were arranged alphabetically within each set.

Teachers were given a copy of the directions, which were read to the group by the investigator. They were as follows:

The children whose names appear on these cards are to be ranked on the following characteristics:

1. participation in classroom discussion
2. creativity
3. leadership

We have no particular meaning for these terms. Use your own judgment about what they mean. There is one stack of cards for each characteristic:

Yellow = participation in classroom discussion
White = creativity
Salmon = leadership

In ranking the children from high to low, use the following procedure:

1. Begin by selecting the child who ranks highest.
2. Next choose the child who ranks lowest.
3. Then choose the child who ranks second highest.
4. Choose the child who ranks next to the lowest.
5. Continue to rank the children by alternately selecting high and low.

This task will be easier if you work with two separate stacks of cards, one for the lows and one for the highs. Work from the lowest up for the lows, and the highest down for the highs. Work quickly.

Even though in the process of ranking, you alternate between high and low, when you are finished, the cards should be stacked in regular rank order from high to low. When you are satisfied with the order, write the number representing the child's rank in the upper right hand corner of the card.

1 = the child ranking highest
2 = the child ranking second highest, and so forth.

On the card for the child ranking highest, also write highest. On the card for the child ranking lowest, write lowest. These are the only two cards on which you write out the rank.

Place the card with your name on top of the stack of cards and replace the rubber band.

Begin with the yellow stack first and complete it before proceeding to the next stack. Once the yellow stack is finished, set it aside and do not work with it again.

> Proceed to the white stack. When it is completed, set it aside and do not work with it again. Rank the salmon cards last.
>
> At the regular meeting in January, you will be asked to make judgments about the academic ability of the children in your class. Please do not discuss this project until it is completed. It is particularly important that those of you who teach in the 7th and 8th grades do not discuss the judgments that you have made or will make next time, since you have ranked the same children.

At the time of the second session, the teachers were given the cards for ranking children with respect to academic ability. These cards had also been prepared as described above. When that ranking task was completed, they picked up the next set of cards, which was for ranking children for participation in classroom discussion. After these cards were turned in, they picked up the final set and ranked the children for creativity.

During the third session, the second investigator explained the purpose of the study and presented the results of the previous trials. The teachers were specifically told that the purpose of the study was to learn whether this kind of ranking task could be done--that it was, perhaps, too difficult for anyone to do reliably. They were also told that they had been selected as a representative group of teachers; if the rankings were not reliable, the investigators would abandon this technique as unsuitable for studying the effects of speech deviations. Following this discussion, the teachers were again asked to rank the children according to participation in classroom discussion. Two teachers were absent from this meeting; their rankings were obtained individually.

RESULTS

Spearman rank order correlations between repeated rankings of children according to participation in classroom discussion were computed for each teacher. Correlations between trials one and two ranged from .50 to .93; the range for trials one and three was .52 to .89; and for trials two and three, .46 to .96. All correlations are significant beyond the .01 level of confidence. The correlations are shown in Table 31.

Spearman rank order correlations were also computed for the two rankings of children on creativity. Results were similar to those for rankings on participation in classroom discussion. The $\underline{r}_s$s ranged from .46 to .95. Here, again, all correlations were significant beyond the .01 level of confidence. These results are shown in Table 32.

Table 31. Spearman rank order correlations between repeated rankings of children for extent of participation in classroom discussion. All r_Ss are significant beyond the .01 level of confidence.

Grade	df	Trials 1 and 2		Trials 1 and 3		Trials 2 and 3	
		r_S	t	r_S	t	r_S	t
K	25	.79	6.44	.69	4.77	.77	6.03
K	25	.76	5.38	.69	4.77	.77	6.03
1	29	.83	8.01	.83	8.01	.89	10.51
1	30	.89	10.69	.86	9.23	.86	9.23
1	29	.91	11.82	.85	8.69	.83	8.01
2	30	.56	3.71	.66	4.81	.67	4.94
2	26	.76	5.96	.73	5.45	.67	4.60
2	31	.90	11.50	.89	10.87	.89	10.87
3	24	.84	7.58	.77	5.91	.86	8.25
3	29	.86	9.07	.89	10.51	.79	6.94
3	26	.86	8.60	.88	9.44	.85	8.23
4	25	.88	9.26	.83	7.44	.76	5.85
4	27	.93	10.87	.84	7.09	.88	8.49
4	23	.61	3.69	.52	2.82	.73	5.12
4	23	.90	9.91	.69	4.57	.63	3.89
5	33	.76	6.72	.85	8.27	.75	6.52
5	33	.92	13.49	.84	8.89	.80	7.66
5	32	.56	3.82	.66	4.97	.63	4.59
6	22	.50	2.71	.61	3.61	.70	4.60
6	24	.63	3.98	.74	5.39	.46	2.54
6	24	.80	6.53	.78	6.10	.85	7.86
6	24	.90	10.11	.85	7.91	.84	7.58
7	30	.85	8.84	.86	9.23	.80	7.30
7	30	.80	7.30	.84	8.48	.75	6.21
8	27	.89	10.14	.84	8.04	.96	17.82
8	27	.89	10.14	.82	7.44	.89	10.14
8	27	.86	8.76	.60	3.90	.56	3.51

Table 32. Spearman rank order correlations of children for creativity. All $\underline{r_S}$s are significant beyond the .01 level of confidence.

Grade	df	r_S	t
K	25	.95	15.21
K	25	.58	3.56
1	29	.69	5.13
1	30	.76	6.41
1	29	.85	8.69
2	30	.46	2.84
2	26	.81	7.05
2	31	.92	13.07
3	24	.87	8.65
3	29	.56	3.64
3	26	.88	9.45
4	25	.76	5.84
4	21	.79	5.90
4	23	.76	5.61
4	23	.80	6.39
5	33	.65	4.91
5	33	.93	14.54
5	32	.75	6.41
6	22	.82	6.72
6	24	.78	6.11
6	24	.82	7.02
6	24	.69	4.67
7	30	.88	10.15
7	30	.89	10.69
8	29	.90	10.73
8	29	.80	6.93
8	29	.76	6.08

The two seventh-grade teachers ranked the same group of children. Spearman rank order correlations for these rankings for three characteristics were very low and ranged from .11 to .17 on Trial 1, .23 to .41 on Trial 2. For the two sets of rankings of children on participation in classroom discussion, $\underline{r}_S$ for Trial 3 was .48, significant beyond the .01 level. The only other significant $\underline{r}_S$ was that for rankings on participation in classroom discussion from Trial 2. These data are shown in Table 33.

Three eighth-grade teachers ranked the same group of children. Spearman rank order correlations for pairs of teachers on three characteristics ranged from .46 to .68 on Trial 1, and .11 to .75 on Trial 2.

Only one $\underline{r}_S$ was not significant. Correlations for rankings on participation in classroom discussion for pairs of teachers on Trial 3 ranged from .45 to .55 and were significant at or beyond the .01 level. These data are shown in Table 34.

Kendall's coefficient of concordance (75, pp. 229-239) was computed for each teacher's ranking orders for the three characteristics in Trial 1 and in Trial 2. All but one teacher gave children similar ranks on all characteristics. In Trial 1, the children were ranked on participation in classroom discussion, creativity, and leadership. In Trial 2, the characteristics were participation in classroom discussion, creativity, and academic ability. As can be seen in Table 35, $\underline{W}$s were similar for both trials.

DISCUSSION

The reliability of rankings made by classroom teachers is somewhat lower than is desirable for a measuring technique for determining whether speech deviations affect children's willingness to participate in classroom discussion. The very low correlations among rankings of the same group of children are even more damaging than the reliability figures. In addition, the evidence indicates that children are assigned much the same rank regardless of the characteristic on which they are being ranked. Some common factor seems to be operating.

There are several possible reasons for the very low agreement between teachers, particularly as far as participation in classroom discussion is concerned. The children's behavior may actually vary as a function of classroom atmosphere created by the teacher or as a function of subject matter, which is confounded with teachers in this case. The other alternative is that the children's behavior is reasonably consistent, but observer agreement is low. Low agreement could be due to relatively unstructured instructions that were used, or ranking children may call for finer discriminations than can be made.

Table 33. Spearman rank order correlations between sets of ratings by two seventh-grade teachers on two trials with three characteristics and for the third trial with one characteristic. (For all *t*s, df = 30.)

Characteristic	Trial 1		Trial 2		Trial 3	
	r_S	t	r_S	t	r_S	t
Participation in classroom discussion	.11	.61	.41	2.46*	.48	3.00**
Creativity	.17	.95	.25	1.42		
Leadership	.14	.77	.23	1.29		

*P = .01
**P .01

Table 34. Spearman rank order correlations between rankings made by three pairs of eighth-grade teachers on two trials with three characteristics and for the third trial with one characteristic. All _t_s (df = 27) are significant at or beyond the .01 level of confidence unless otherwise marked.

Characteristic	Trial 1		Trial 2		Trial 3	
	r_S	_t_	r_S	_t_	r_S	_t_
T1 and T2						
Participation in classroom discussion	.50	3.00	.63	4.21	.55	3.42
Creativity	.46	2.69	.51	3.08		
Leadership	.53	3.25	.68	4.82		
T1 and T3						
Participation in classroom discussion	.57	3.60	.53	3.25	.54	3.31
Creativity	.53	3.25	.37	2.07*		
Leadership	.65	4.45	.75	5.89		
T2 and T3						
Participation in classroom discussion	.54	3.33	.56	3.51	.45	2.62
Creativity	.54	3.33	.11	.58**		
Leadership	.68	4.82	.59	3.80		

*P = .025.
**P = .60

Table 35. Coefficients of concordance (Kendall) for rankings for participation in classroom discussion, creativity, and leadership (Trial 1) and for participation in classroom discussion, creativity, and academic ability (Trial 2).

			Trial 1				Trial 2	
Grade	W	df	χ^2	P*	W	df	χ^2	P*
K	.77	26	60.06	.001	.75	26	58.50	.001
K	.81	26	63.18	.001	.80	26	62.40	.001
1	.81	30	72.90	.001	.71	30	63.90	.001
1	.70	31	65.10	.001	.71	31	66.03	.001
1	.87	30	78.30	.001	.82	30	73.80	.001
2	.69	31	64.17	.001	.55	31	51.15	.01
2	.81	27	65.61	.001	.72	27	58.32	.001
2	.88	32	84.48	.001	.85	32	81.60	.001
3	.55	25	41.25	.05	.72	25	54.00	.001
3	.68	30	61.20	.001	.80	30	72.00	.001
3	.87	27	70.47	.001	.94	27	76.14	.001
4	.64	26	49.92	.01	.52	26	40.56	.05
4	.60	22	39.60	.02	.54	22	35.64	.05
4	.57	24	41.04	.02	.69	24	49.68	.01
4	.72	24	51.84	.001	.75	24	54.00	.001
5	.84	34	85.68	.001	.81	34	82.62	.001
5	.85	34	86.70	.001	.87	34	88.74	.001
5	.46	33	45.54	.05	.53	33	52.47	.01
6	.34	23	23.46	.50	.28	23	19.32	.70
6	.56	25	42.00	.02	.61	25	45.75	.01
6	.65	25	48.75	.01	.68	25	51.00	.01
6	.85	25	63.75	.001	.81	25	60.75	.001
7	.96	31	89.28	.001	.87	31	80.91	.001
7	.78	31	72.54	.001	.76	31	70.68	.001
8	.73	28	61.32	.001	.87	28	73.08	.001
8	.73	28	61.32	.001	.74	28	62.16	.001
8	.59	28	49.56	.01	.70	28	58.80	.001

*P is the probability for the nearest tabled chi square.

The results of this study indicate that teacher rankings of children is not a suitable technique for determining behavior in the classroom.

Another study might be conducted to determine whether children could be reliably categorized into four or five groups. This task should be easier than establishing a rank order. Furthermore, the importance of the variable itself needs to be examined. After the rankings were completed, the teachers were invited to discuss their opinions about speech-defective children's participation in classroom discussion. These teachers have the impression that speech deviations do not affect participation significantly. Their opinions suggest that home background and intelligence are more important. Very bright children tend to be communicative only in the presence of children of similar ability; thus, it is the children with average ability who participate most. Regardless of the untested validity of these opinions, the significance of participation in classroom discussion should be studied before additional attempts are made to determine any relation between this behavior and speech deviations.

SUMMARY AND CONCLUSIONS

Twenty-seven classroom teachers ranked the children in their classrooms on four characteristics. Three trials were given for ranking children on the amount of participation in classroom discussion. Two trials were given for rankings on creativity and leadership. One trial was given for ranking academic ability.

On the basis of these data the following conclusions appear warranted:

1. Spearman rank order correlations for repeated trials of ranking children on several characteristics are, overall, lower than desirable for using this technique in research.

2. Agreement between teachers ranking the same group is very low.

3. Children are assigned similar ranks, regardless of the characteristic on which they are ranked.

Discussion with the teachers indicated the advisability of determining the significance of participation in classroom discussion per se before pursuing further studies of the effect of speech deviations on this aspect of behavior.

Acknowledgment: Shirley S. Taylor, Consultant and Speech and Hearing Clinician in the Nevada County Superintendent of Schools Office was the co-investigator for this study.

DISCUSSION

These projects illustrate that a research center for school clinicians is a feasible approach to research related to school speech and hearing programs. Such a center has the potential for developing a unified and coordinated approach to resolving many of the issues pertaining to these programs. It is a practical and workable concept.

A research center of the type herein discussed can activate resources for research that would otherwise lie dormant. The work with the California Speech and Hearing Association Research Committee is one example. State associations have a communication system and a means for establishing working relations with representatives of a variety of work environments. A professional organization generates volunteer services and a level of cooperation available to neither individual researchers or institutions. Furthermore, state associations are of a size that is practical, being neither so large that they are cumbersome nor so small that they are restricted in scope. The potential for interassociation cooperation in joint projects and replication of studies can only be inferred, since activities in this respect are in their inchoate stage at this time.

A research center is essential, however, for maximizing productiveness of these groups. It can provide the continuity so necessary for activities of volunteer groups. It can assume routine details and supply necessary services that are beyond the financial capabilities of state organizations. The kinds of problems appropriate for study by state association committees have been of little interest to researchers--at least researchers have shown no interest in them heretofore. Some kinds of research will probably always remain the function of a professional association. The survey of practices in supervised school experience for student clinicians is representative of this kind of research. Whereas some 20 training institutions supplied extensive mailing lists for an association project, it is highly unlikely that any one training institution or individual could have engaged cooperation for this magnitude for institution-sponsored research.

These committees are ideal for surveying problem areas of broad general interest to the profession. They have the capability for formulating and the machinery for implementing studies that cut across a variety of special interest areas. They can bring inter-relations among these special-interest groups into focus, as in the study of interagency communication now being developed. Certainly, the kind of research that such groups can undertake is restricted, but it represents a significant though small part of the total research needs relative to speech and hearing programs in schools.

The utilization of resources is also illustrated by the proposed research in the Los Angeles area. This research is completely dependent upon a set of complex relations and interactions that are a function of the ways in which these school districts operate. These working relations could not be superimposed on these districts by any outside agent hoping to conduct research in them. The research represents active participation of 39 school districts and the 210 clinicians with an aggregate of 25,000 cases. It requires a drastic alteration in normal procedures. Such a change can be produced only from within the systems. It must be sponsored by personnel who have gained the confidence of the clinicians over a period of years. The literature gives no indication whatever that any project of this magnitude has heretofore been undertaken. It is a cooperative project of these 210 clinicians; it is not a matter of supplying a population of children for someone else's research.

In this case, the Center supplied the third member of the team. Without this team member to assume certain kinds of responsibilities, the research project would have required so much additional time of the Los Angeles group that it would not have been possible. Supervisors and coordinators of speech and hearing programs are the key to research requiring large populations. Yet the larger the populations they represent, the less time they have for research.

The particular project for which a proposal was developed epitomizes a parsimonious approach to what might be called an evaluation of school speech and hearing programs. The project proposes to determine the characteristics of children in existing caseloads while simultaneously devising the means for quality control in case selection and assessment. In addition, the training materials that should come out of this project will obviate one of the greatest obstacles to research by school clinicians. These materials will constitute what is, in effect, a calibrating device. A point that cannot be overstressed is that these materials will be designed so that they can actually be used in schools, and clinicians can be trained to meet specifiable standards for judging oral communication skills. Materials do not exist today that meet the requirements for routine use with school clinicians.

It seems reasonable to assume that unless resources such as these are activated, little progress will be made in research that will resolve the problems indigenous to school programs. Not only is a research center of the kind described the only way of mobilizing these resources that presents itself at this time, research supported through a center is far less expensive than it is under ordinary conditions. The research represented in the Los Angeles project would require an estimated $200,000 more in grant funds than are currently needed were such a project to be undertaken without the resources that have been brought to bear on it. Indeed, the project would not be possible at all under usual research procedures, since it depends upon internal collaboration that is an inextricable part of existing functional relations.

A research center serves to unify approaches to research. Without in any way dictating research problems or methods, it can focus on one or more approaches to resolving some universal problems in research. Some of the projects included in this report illustrate a kind of unity that has already been achieved. The observation checklist for the Novato study was developed from the Los Angeles case record long before the record itself was published. The low level of interclinician agreement among three clinicians who work closely together and who share similar philosophies and backgrounds has implications for reliability studies and the development of standard training materials for quality control proposed in the Los Angeles study. In the latter case, the 210 clinicians work in dissimilar programs and have been recruited from training institutions throughout the nation. Some of the solutions for increasing agreement as well as the knowledge of areas depressing agreement developed in the Novato study will be of assistance in the larger study. The problems of using information from school records not designed for data retrieval adds further argument for continued development and refinement of the Los Angeles record form.

The Center was able to obtain a much broader sample of reactions during the development of the case record than would have been possible otherwise. The Center has also distributed the case record to many clinicians throughout California and the Midwest. Through its numerous projects, the Center can establish the contacts necessary for widespread cooperation with a variety of projects.

Comparisons among these projects indicate that clinicians should be involved in the entire planning and decision-making process. The only study in which clinicians did not participate in this way was the study of coordinated research in which a preformulated research plan was presented and cooperation solicited. While cooperation was excellent, these clinicians did not have the same commitment to this project that the clinicians in the other projects developed. Actually, they were not given an adequate opportunity to do so. Even in the case of the research delegated to another clinician, the commitment existed largely because of participation in many of the decisions and total responsibility for conducting the sessions during which information was gathered.

Both the Novato study, concerned with the evaluation of a procedure for assessing oral communication skills of kindergarten children, and the Indianapolis project, in which two methods studies are being developed, represent significant movement in research related to school programs. Characteristically, clinicians elaborate upon accepted ways of meeting problems or develop new approaches. Programs are revised and altered and enthusiastic recommendations made for adoption of new or revised programs. Yet these programs have never been tested objectively. They are accepted or discarded on the basis of subjective judgment. The kind of research represented by the Novato project is not only entirely compatible with the service function of school clinicians, but is essential to it if schools are to have any assurance that the programs they adopt are both efficient and effective. Procedures recommended on the basis of clinical judgment are not specified at the level required for research. The program refinement and specificity of operations necessary for testing a program through research methods mean that programs so developed can actually be transmitted to other clinicians. Any failure to achieve similar results would be due to failure to follow the program as designated.

A similar observation obtains for therapy methods. Therapy most often proceeds by traditions that have been learned through imitation and clinical judgments, neither of which have been objectified or tested. Clinicians could be trained more quickly, and therapy would be more efficient if methods were stated in behavioral terms and specified with detailed criteria for determining the amount of learning that has taken place. The approach to the development of therapy methods being used in two projects in the Indianapolis schools is an attempt to produce methods so explicit that they can be transmitted to other clinicians. This approach also produces a method that can be manipulated and tested against a set of objective results so that efficiency can be maximized. It is an approach that makes the study of methods per se possible.

The Center's activities also demonstrated that this approach is a feasible one for collecting information that must come from therapy programs, particularly the kind of information that depends upon response to treatment. It is the least expensive way of gathering these data. It is also the most feasible approach if data are to reflect normal school conditions. Through coordinated, widespread clinician participation, some of the problems of research in schools can be resolved. Specifically, the consequences of attrition in the subject population can be minimized, since full-time paid researchers are not involved in the treatment process. Untreated control groups are possible, since untreated children would not be concentrated in any one school assigned to any one clinician.

Two important conditions pertaining to consultation for clinicians conducting research in schools have evolved. The kind of consultation that is needed differs from that ordinarily used by researchers. Whereas the researcher usually asks for consultation on a specific aspect of a study and uses a specialist for this purpose, school clinicians need a consultant to serve in a more general capacity--one who is willing to work through the entire research plan and assist in making decisions. Furthermore, consultation must be available on a continuing rather than short-term basis. Needless to say, the consultant must be knowledgable about the ways in which schools operate and the attitudes found therein.

Requests for workshops also indicate considerable interest in research that is ready to be mobilized. The possibilities for research need further development through specific prospectuses with explicit directions for procedures. While the development of premade plans may seem to contradict the concept that clinicians should participate in the formulation of the plans for whatever research they are to conduct, these plans are useful in making the feasibility of combining research and service manifest. They serve as a frame of reference from which clinicians can develop projects in keeping with their particular interests. A series of such plans have been started and were presented at the ASHA National Convention in 1966.

Finally, there is need for consultation for situations in which research is mandatory rather than optional. Though it is surprising to find that mandatory research does not always carry the financial assistance necessary to buy consultation, the situation does exist. A research center could become a resource for consultation prior to the establishment of innovative programs. Programs could be set up so that they could be evaluated; thus the untenable situation of attempting to design research for a program post facto could be precluded.

Perhaps the greatest misunderstanding among school clinicians centers around the amount of planning and the specificity of detail required for research. The shortcomings of trying to evaluate a new program that is already in operation are also a source of misunderstanding to those not trained in research.

Certain conditions about the location of a research center may be inferred from this project. A center should be located in a moderately large population center that also has a college or university in it. Community size affects the nature of the relations with schools that a research center can establish and maintain. It is important that a center be in direct and continuous contact with schools and school clinicians in order to have feedback on a variety of school-related problems and conditions. Time limitations while consulting away from the Center usually restrict the use of clinicians working on their own projects for testing new ideas. If a community is too large, the school district will be so large that it is encumbered with the restrictions necessary for controlling very large operations. If the community is too small, not enough school resources are available. The requirement for location in a community with a college stems from the center's need for library facilities. Of equal importance is that a ready supply of research assistants is available from a college. With a steady supply of graduate students available, they can be used as needed, which effects an economy when workloads are variable. An added advantage--at least one that obtained in the present study--was that informal consultation with former colleagues in related fields was readily available.

Further elaboration of a research center for school clinicians should include the function of informal dissemination of results of research as well as a system of data storage and retrieval. For example, information about stimulability, inconsistency, and diadochokinetic rate should be immediately available, including the methods employed in various studies, without having to read through complete reports to find it. Additional emphasis might be placed on stimulating and developing the interaction between state association research committees. A program for research workshops for school clinicians might be developed. A series of one-week summer institutes for school clinicians who have specific research problems they wish to pursue might be developed.

CONCLUSIONS

The conclusions that appear warranted on the basis of the model for a research center for school clinicians that was evolved and tested are as follows:

1. A research center for school clinicians is a workable instrument for stimulating and facilitating research.
2. A research center can mobilize resources that are not available to other researchers and that would lie dormant without the center's services.
3. A research center is an inexpensive means for producing a large volume of research.
4. Coordinated research involving a large number of participating clinicians can resolve, to a large extent, the problems of attrition in subject populations and untreated control groups, so vexing in school research.
5. A center can produce a unified attack on many of the issues of long-standing that pertain to school programs.
6. Research activities are compatible with the service function of school clinicians in the presence of consultation and relief from the clerical details of research.
7. School clinicians are interested in research and participate effectively.
8. School clinicians should participate in formulating the plans for any research they might conduct.
9. Research meaningful to school programs is more likely to be produced by school clinicians than by researchers not conversant with the conditions under which school programs operate. Research should be designed to produce results that are useable in schools.
10. A broad range of research projects can be implemented in this way.

Several conclusions about the kind of consultation school clinicians need developed from this study:

1. Consultation is as much needed in large school districts having their own research departments as in small schools not having these resources.

2. Consultation should be ongoing and concerned with the total development of a research project as opposed to consultation for isolated technical details only.

3. Consultation must be adjusted to the realities and restrictions imposed by the school environment.

A research center for speech and hearing clinicians should be located in a community with the following characteristics:

1. The community should be of moderate size so that the center's personnel can establish close relations with local schools.

2. The community should contain a college or university that has training programs in speech pathology and audiology so that both library facilities and a ready supply of part-time research assistants are available.

3. If the center's personnel have previously-established relations in the academic community, informal consultation with former colleagues in a variety of professional and academic fields is available at no expense.

A future research center should expand its services to include the following:

1. A research center should have the means for informal dissemination of reports of research and should serve as a clearinghouse for the interchange of ideas for cooperative research.

2. It should be prepared to provide standard workshops for groups on request.

3. It should have a storage bank and retrieval system for certain kinds of information.

4. It should explore the possibilities for short summer institutes for school clinicians wishing to engage in specific research projects.

SUMMARY

The lack of objective data from which standards can be derived for nearly all important aspects of therapy programs makes any current attempts to evaluate school speech and hearing programs unrealistic. A tremendous amount of information is needed about case selection, age for beginning therapy, the relation between speech deviations and other language skills, all aspects of therapy schedules, dismissal criteria, therapy methods, and the consequences to speech deviations.

A design for an experimental approach to determining the effects of schedules and age at the time therapy begins was developed. Such a project would be expensive and would contribute but a small portion of the total information needed. The problems attendant upon well-controlled research in schools are numerous and include maintaining placebo treatment and untreated control groups, attrition in subject populations, and assignment of clinicians to treatment groups to avoid contamination of results due to bias. Use of clinician time would be inefficient, therapy programs in the participating schools would be disrupted, and public and professional relations would be subject to stress.

A model for a research center for school clinicians was developed and tested to determine its capabilities for evolving information necessary to arrive at standards for school speech and hearing programs. A total of eight different projects were undertaken. Six research reports, one research proposal, and four prospectuses grew out of these projects.

One project involved a state speech and hearing association research committee and resulted in three reports of opinion surveys about practices in school experience for student clinicians and the first phase of a survey of standardized tests used by clinicians in schools. Another project was conducted in cooperation with a small district in which research methods were applied to the evaluation of a procedure for assessing oral communication skills of kindergarten children. One research report is about the results of coordinated research in which 23 clinicians in five school districts and two county offices participated. The subject of the sixth report is the reliability of teacher rankings of children with respect to participation in classroom discussion.

A research proposal, which has been submitted for funding, was developed for a study of the characteristics of children receiving speech and hearing services in 39 school districts in the Los Angeles area. Prospectuses and directions for four pilot studies--two methods studies, one sound-error remission study, and one stimulability study--were also developed and the studies have been started.

Two other projects were undertaken that point up certain needs. These needs are a resource for planning for evaluation of innovative programs prior to their establishment and a speech and hearing data retrieval code so that the voluminous information routinely accumulated in unretrievable form in speech and hearing programs is not lost.

The functions of a research center are described relative to each of these projects. To be effective, consultation from such a center must be an ongoing service and general in nature as opposed to consultation for technical aspects of research only. Data-reduction and report-writing services are also necessary to maximize productivity of participants.

These projects demonstrate that a research center can mobilize resources not otherwise available to researchers. They also indicate that school clinicians are not only interested in research, but can participate effectively in ways compatible with their service functions if consultation and relief from clerical details of research are provided. Through widespread clinician participation, the problems of subject population attrition and untreated control groups in school research can be resolved to a large extent. Participation of school clinicians is necessary if realistic solutions to school problems are to be evolved and if results are to have more than theoretic application to school programs.

A research center can effect a coordinated and unified attack on resolving many of the issues pertaining to school speech and hearing programs, thereby compensating for the sporadic and fragmentary attention these problems have received. Its primary focus should be on assisting school clinicians with research of their own choosing; nonetheless, this approach will produce a unified body of information, since the problems germane to school programs are universal.

Not only should a research center be continued, its services should be expanded. It is a feasible and parsimonious approach to research related to school speech and hearing programs.

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APPENDIX A

THE LOS ANGELES ABSTRACT OF CASE RECORD

(This material is included with the permission of the Los Angeles County Superintendent of Schools Office.)

LAST NAME FIRST MIDDLE

LAST NAME FIRST MIDDLE

PARENTS (GUARDIANS) LAST NAME FIRST

BIRTHDATE AGE SEX M F

Speech and Hearing

Abstract of Case Record

School Districts in Los Angeles County

Date 1ST YEAR (BLACK) / 2ND YEAR (RED) / 3RD YEAR (GREEN)

COMPLETE ADDRESS (STREET NO.) (STREET NAME—INDICATE AVE., BLVD., ST., ETC. AND N., S., W. OR E.) ZIP CODE
CITY COUNTY PHONE
SCHOOL DISTRICT SCHOOL S-H SPECIALIST

COMPLETE ADDRESS (STREET NO.) (STREET NAME—INDICATE AVE., BLVD., ST., ETC. AND N., S., W. OR E.) ZIP CODE
CITY COUNTY PHONE
SCHOOL DISTRICT SCHOOL S-H SPECIALIST

COMPLETE ADDRESS (STREET NO.) (STREET NAME—INDICATE AVE., BLVD., ST., ETC. AND N., S., W. OR E.) ZIP CODE
CITY COUNTY PHONE
SCHOOL DISTRICT SCHOOL S-H SPECIALIST

		SCHEDULE		NUMBER OF SESSIONS			
		SESSIONS PER WEEK	LENGTH IN MINUTES	PRESENT	ABSENT		
1ST YEAR	GROUP					/	Starting Date
	INDIVIDUAL						Closing Date
2ND YEAR	GROUP					/	Starting Date
	INDIVIDUAL						Closing Date
3RD YEAR	GROUP					/	Starting Date
	INDIVIDUAL						Closing Date

COLOR CODE: 1ST YEAR, USE BLACK INK; 2ND YEAR, USE RED INK; 3RD YEAR, USE GREEN INK.

PART A. Identification Data

1. TYPE OF CLASS
(CHECK)

a. Regular Class ______

b. Special Class ______

- Aurally Handicapped ______
- Cerebral Palsy ______
- Other Orthopedically Handicapped ______
- Aphasic ______
- Educable M.R. ______
- Trainable M.R. ______
- Educationally Handicapped ______
- Visually Handicapped ______
- Gifted ______
- Individual Instruction- Home ______
- Individual Instruction–Institution ______

c. Pre-school ______

2. GRADE LEVEL
(CIRCLE)

Preschool
K
1
2
3
4
5
6
7
8
9
10
11
12

Multigrade
K-3
4-6
7-9
10-12

Ungraded
Lower
Middle
Upper

3. HISTORY SPEECH-HEARING THERAPY
(CHECK)

No Previous Therapy ______
Current Therapy–Outside Agency ___ ___ ___
Years Previous Therapy–School ___ ___ ___
Years Previous Therapy–Outside Agency ___ ___ ___

4. TEST RESULTS
(WITHIN PAST 2 YEARS)
(CHECK)

Reading Readiness DATE ______

- Below Average ______
- Average ______
- Above Average ______

Reading Achievement DATE ______

- Below Grade Level ______
- At Grade Level ______
- Above Grade Level ______

Arithmetic Achievement DATE ______

a. Fundamentals

- Below Grade Level ______
- At Grade Level ______
- Above Grade Level ______

b. Reasoning

- Below Grade Level ______
- At Grade Level ______
- Above Grade Level ______

Intelligence Tests

IQ	TEST	DATE

5. CASE INDENTIFICATION
(CIRCLE)

a. Screening
b. Referral

- Teacher
- Parents
- Self
- Administrator
- Guidance Personnel
- Health Personnel
- Other ______________________

COLOR CODE: 1ST YEAR, USE BLACK INK; 2ND YEAR, USE RED INK; 3RD YEAR, USE GREEN INK.

PART B. Family Information

1. PARENTS IN HOME
(CIRCLE TWO)

Mother	Father
Natural	Natural
Adoptive	Adoptive
Step	Step
Foster	Foster
Grand	Grand
None	None

2. SIBLINGS AND OTHERS IN HOME
(FILL IN)

Order of Student's Birth ________

Student Is a Twin ________

Number of Siblings ________

No. of Other Children (Not Sibs) in Home ________

No. Adults Besides Parents in Home ________

3. LANGUAGES SPOKEN IN HOME
(CHECK OR FILL IN)

No Information ________

English Only ________

Other ________________

____

____

4. SPEECH PROBLEMS IN FAMILY

Yes ________ No ________ No Information ________

Relationship to Student	Problem

PART C. General Health History
(CHECK EACH ITEM THAT APPLIES)
(Also, check if this type of information is not available.)

1. HEALTH HISTORY

	Yes	No	No Information
Frequent Colds			
Frequent Sore Throats			
Frequent Ear Infections			
High Temperatures			
Serious Early Illness			
Convulsions—Seizures			
Heart Condition			
Diabetes			
Allergies			
Asthma			
Skull Fracture			
Premature Birth			
Difficult Birth			
Birth Injury			

2. PHYSICIAN OR DENTIST DIAGNOSIS
(Made by physicians or dentists.)

	Yes	No	No Information
Tongue Thrust			
Cleft Lip			
Cleft Palate			
Spasticity			
Athetosis			
Other Paralysis			
Laryngeal Pathology			
Hearing Pathology			
Visual Pathology			
Neurologic Disorder			

COLOR CODE: 1ST YEAR, USE BLACK INK; 2ND YEAR, USE RED INK; 3RD YEAR, USE GREEN INK.

PART C. (cont'd)

3. MEDICAL, DENTAL OR OTHER TREATMENT

Referral Needed

Teeth ______

Palate ______

Lips ______

Ears ______

Nose ______

Throat ______

Muscular Function ______

Eyes ______

Behavior ______

Recommendations by other professions

	Not Recommended	Recommended	In Progress	Completed	Source of Information (FILL IN)
Orthodontia					
Tonsils Removed					
Adenoids Removed					
Laryngeal Surgery					
Cleft Lip Surgery					
Cleft Palate Surgery					
Treatment for Ears					
Physical Therapy					
Braces (Extremities)					
Hearing Aid					
Oral Prosthesis					
Glasses					
Psychiatric					
Psychologic					

PART D. Hearing Information

1. HEARING STATUS

No hearing loss ______ Passed screening test ______ Date ______ 1ST YEAR (BLACK) / 2ND YEAR (RED) / 3RD YEAR (GREEN)

Hearing loss present ______ Previous loss (no longer present) ______

2. TEST RESULTS

Threshold ______ Screening at ______ dB

		250	500	1000	2000	4000	8000
AC	R						
	L						

BC	R						ASA ___
	L						ISO ___

SRT ______ dB PB ______ % at ______ SL

Date ______ Test by: Audiometrist, Nurse, Otologist, S-H Specialist, Aud. Clinic

Threshold ______ Screening at ______ dB

		250	500	1000	2000	4000	8000
AC	R						
	L						

BC	R						ASA ___
	L						ISO ___

SRT ______ dB PB ______ % at ______ SL

Date ______ Test by: Audiometrist, Nurse, Otologist, S-H Specialist, Aud. Clinic

3. AMPLIFICATION

Make, model of aid ______ Setting ______ Ear(s) ______

Wears full time ______ part time ______ PB (aided) ______ %

Group aid/auditory trainer ______ Make, model ______

Output setting L ______ R ______ Frequency response setting L ______ R ______

COLOR CODE: 1ST YEAR, USE BLACK INK; 2ND YEAR, USE RED INK; 3RD YEAR, USE GREEN INK.

PART E. Spontaneous Speech

(If normal or adequate, circle normal; if deviant, circle deviant, etc., as well as the condition that makes it deviant.)

- **1. Articulation**
  - a. Vowels
    - Normal
    - Deviant
  - b. Consonants
    - Normal
    - Deviant
      - Omissions
      - Distortions
      - Substitutions
      - Additions
  - c. Errors
    - Consistent
    - Inconsistent
- **2. Dialect**
  - Normal
  - Deviant
    - Regional
    - Foreign
- **3. Intelligibility**
  - Intelligible
  - Partially intelligible
  - Unintelligible
- **4. Fluency**
  - Normal fluency
  - Nonfluent
    - Word-phrase repetition
    - Syllable repetition
    - Prolongations
    - Interjections
    - Unvocalized intervals
    - Other________________
- **5. Voice Quality**
  - Normal
  - Deviant
    - Breathy
    - Harsh
    - Hoarse
    - Nasal
    - Denasal
    - Other______________
- **6. Pitch**
  - Normal
  - Deviant
    - Too high
    - Too low
    - Monotonous
    - Other______________
- **7. Loudness**
  - Normal
  - Deviant
    - Too loud
    - Too soft
    - Monotonous
    - Other______________
- **8. Rate**
  - Normal
  - Deviant
    - Too rapid
    - Too slow
    - Jerky
    - Other______________
- **9. Language**
  - a. Length of responses
    - Acceptable
    - Inadequate
      - Little or no verbal response
      - Brief responses
      - Excessive verbal output
  - b. Vocabulary
    - Acceptable
    - Limited
  - c. Grammar
    - Acceptable
    - Poor

PART F. Communicative Responsiveness

(CIRCLE)

- **1. Responsiveness**
  - Adequate
  - Deviant
    - Unresponsive
    - Primarily relates nonverbally
    - Slowness in responding
    - Irrelevant responses
    - Bizarre responses
    - Other________________
- **2. Eye Contact**
  - Adequate
  - Infrequent

PART G. Observed Physical Behaviors

(CIRCLE)

- **1. Drooling**
  - None
  - Present
- **2. Undesirable Oral Habits** (Sucking, biting, chewing of lips, nails, finger, objects, etc.)
  - None observed
  - Present
- **3. Facial Grimaces and Tics**
  - None observed
  - Present
- **4. Gross Bodily Movements & Mannerisms**
  - Normal
  - Deviant
- **5. Hand Usage**
  - Right
  - Left
  - Ambidextrous
- **6. Foot Usage**
  - Right
  - Left
  - Mixed
- **7. Eye Usage**
  - Right
  - Left
  - Mixed

COLOR CODE: 1ST YEAR, USE BLACK INK; 2ND YEAR, USE RED INK; 3RD YEAR, USE GREEN INK.

PART H. Speech Mechanism

Structure and Function For Speech Production Based on S-H Specialist's Exam.

(If a structure does not interfere with speech, circle adequate; otherwise, indicate the condition that causes the inadequacy.)

1. Lips
- Adequate
- Inadequate
  - Repaired Cleft
  - Cerebral Palsy
  - Poor Mobility
  - Other ________________

2. Teeth
- a. Occlusion
  - Adequate
  - Inadequate
    - Open Bite
    - Over Jet
    - Under Jet
    - Cross Bite
    - Other ________________
- b. Condition of Teeth
  - Adequate
  - Inadequate
    - Deciduous Teeth Missing
    - Permanent Teeth Missing
    - Teeth Malpositioned
    - Caries
    - Other ________________

3. Tongue
- Adequate
- Inadequate
  - Lack of Mobility
  - Too Large
  - Asymmetrical
  - Other ________________

4. Hard Palate
- Adequate
  - Normal Structure
  - Repaired Cleft
  - Prothesis
- Inadequate
  - Repaired Cleft
  - Prosthesis
  - Other ________________

5. Soft Palate
- Adequate
  - Normal Structure
  - Repaired Cleft
  - Prosthesis
- Inadequate
  - Unrepaired Cleft
  - Submucous Cleft
  - Repaired Cleft
  - Prosthesis
  - Too Short
  - Poor Mobility
  - Asymmetric Function
  - Other ________________

6. Nasal Cavities
- Adequate
- Inadequate
  - Nasal Obstruction
  - Other ________________

7. Breathing Mechanism
- a. Condition
  - Normal
  - Partial Paralysis
- b. Breathing for Speech
  - Adequate
  - Inadequate
    - Shallow
    - Jerky
    - Mouth Breathing
    - Speaking on Inhalation
    - Other ________________
- c. Type
  - Thoracic
  - Abdominal
  - Clavicular

PART I. Expressive Speech or Language Disorder

(Check a single disorder under that category only. If student has multiple disorder, check the most disabling one under "primary," the second most disabling one under "secondary," etc.)

Severity Scale: 1–mild; 2–moderate, 3–severe.

1. Single Disorder Only
- Little or No Speech _____
- Symbolization–Language Disorder _____
- Articulation _____
- Stuttering–Rhythm _____
- Voice disorder _____
- SEVERITY 1 2 3

2. Multiple Expressive Disorder
- a. Primary Disorder
  - Little or No Speech _____
  - Symbolization–Language Disorder _____
  - Articulation _____
  - Stuttering–Rhythm _____
  - Voice disorder _____
  - SEVERITY 1 2 3
- b. Secondary Disorder
  - Little or No Speech _____
  - Symbolization–Language Disorder _____
  - Articulation _____
  - Stuttering–Rhythm _____
  - Voice disorder _____
  - SEVERITY 1 2 3
- c. Tertiary Disorder
  - Little or No Speech _____
  - Symbolization–Language Disorder _____
  - Articulation _____
  - Stuttering–Rhythm _____
  - Voice Disorder _____
  - SEVERITY 1 2 3

COLOR CODE: 1ST YEAR, USE BLACK INK; 2ND YEAR, USE RED INK; 3RD YEAR, USE GREEN INK.

CASE INFORMATION

(Date all notations)

PART J. Articulation Record

Date
1ST YEAR (BLACK) / 2ND YEAR (RED) / 3RD YEAR (GREEN)

VOWELS		CONSONANTS				BLENDS	
			Initial	Medial	Final		
i		m				pr-	
ɪ		n				br-	
ɛ		ŋ				tr-	
æ		p				dr-	
ʌ		b				kr-	
ə		t				gr-	
ɝ		d				fr-	
ɚ		k				θr-	
ɑ		g				ʃr-	
ɔ		r				pl-	
ʊ		l				bl-	
u		f				kl-	
ju		v				gl-	
oʊ		θ				fl-	
aʊ		ð				sm-	
eɪ		s				sn-	
aɪ		z				sp-	
ɔɪ		ʃ				st-	
		ʒ				sk-	
		h				sl-	
		hw				sw-	
		w				tw-	
		j				kw-	
		tʃ				spl-	
		dʒ				spr-	
						str-	
						skr-	
						skw-	

Key

Correct sound: Leave blank.
Substitutions: Show sound substituted.
Distortions: X
Omissions: –

Note: Double underlined items are from the Templin–Darley 50–Item Screening Test.

Second test given in same school year:
Use same color.
Circle corrected sound ○.
Show new or different type error according to key and enclose ☐.

COLOR CODE: 1ST YEAR, USE BLACK INK; 2ND YEAR, USE RED INK; 3RD YEAR, USE GREEN INK.

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APPENDIX B

INSTRUCTIONS
SPEECH AND HEARING ABSTRACT OF CASE RECORDS
SCHOOLS IN LOS ANGELES COUNTY

INTRODUCTION

This record form is intended to summarize rather than replace other kinds of records that you keep. It represents a generally-agreed-on minimum amount of information that should be available on each student in the caseload. Its main purpose is to facilitate communication about cases by providing a standard format for the ordering of information. Once you have become accustomed to the form, it is very simple to find the information you want. Students transfer from school to school; new clinicians are employed by school districts; clinicians may be reassigned to different schools. In any of these contingencies, a standard form helps the clinician become familiar with important information about students who have had previous therapy. Because the case record is in the form of a check list, its use should minimize the chances of inadvertently failing to record important observations. It is intended to simplify the recording process.

The record itself may look peculiar at first, but it has been set up in its present format so that the information contained therein can be put into a data retrieval system. Since data retrieval systems are rigid, accepting only the language for which they are programmed, it is important to conform to the language used in the record. Notations or qualifying comments can be entered in the margins.

The record form is intended to be self-explanatory; however, Part I may need the additional explanation to be found in Part I of the instructions. The best use of the instructions is for a reference for only those sections of the record that seem ambiguous. They will, perhaps clarify questions that arise. They are organized by parts and sections within parts for easy reference.

Neither the case record nor the instructions are regarded as being in their final form. As you use them, please note ambiguities and such changes as would improve either or both.

Comments and suggestions should be reported to
Los Angeles City Schools: Miss Esther Herbert
Los Angeles County Schools: Mrs. Nadine H. Coates

There are three reasons why each and every item on the new case record should be filled out: 1) Each section must be evaluated on the basis of use. 2) A systematic evaluation of cases requires that all aspects of his speech behavior and related conditions be observed.

3) Information about the population of children being served needs to be complete. Therefore, PLEASE BE SURE TO FILL OUT EACH AND EVERY ITEM ON THE CASE RECORD ABSTRACT.

INSTRUCTIONS FOR FILLING OUT ABSTRACT OF CASE RECORDS

GENERAL INSTRUCTIONS

Color Code

Records filled out during the 1966-67 school year should be filled out in black ink (ballpoint pen). Red ink is to be used for all entries made during the 1967-68 school year. All entries for the 1968-69 school year are to be made in green ink. The color code permits the same record to be used for a period of three years, but allows changes in status within any subsection of the record to be immediately apparent.

Changes within a School Year

If the status of the child changes with respect to any information entered on the form during a given school year, date the new entry using the color code for that year. For example, if a child is originally in a class for the aurally handicapped, but is transferred at midyear to a regular class, a check would be placed after Regular Class and the date (day and month or just the month) would be written after the new entry. Thus, under Type of Class, two entries appear in the same color, but one entry carries a date making it possible to tell from the record that the original placement has been changed and when. If the change in placement does not occur until the beginning of the following school year, the new entry need not be dated, since the color code carries the chronological information.

The same principle is followed throughout the record for all items except for a modification in Part J, which is explained under that section.

Child's Name

Child's name can be entered in the upper right-hand corner or upper left-hand corner for convenience in filing. Be sure to use first and middle names so there will be no confusion at some later date.

Parent's Name

Use father's full name, not just initials. If the child is living with a stepfather or guardian, use that name rather than the name of the child's natural father.

Birthdate

Write out the birthdate; for example, January 1, 1965.

Age

Enter the child's age to the nearest year and month. Use a hyphen (-) rather than a decimal to separate years and months; for example, 8-3, 10-0, 9-11. Age should be calculated from the date entered at the time the form is filled out. This date will be shown on the cover page in the space provided just above the address.

Date

Enter the date at the time that the record form is filled out.

Address

In order to allow for entering changes of address, school, and so forth, three separate sets of blanks are provided. If the child moves during the first year, the second address should be entered with black ink. If the move does not take place until the second or third year, enter the new information in the appropriate color code. The complete address is necessary since socioeconomic status will be determined by address.

Schedule

Enter the number of sessions per week for which the child is scheduled and the length per session in minutes. The time does not represent the cumulative time per week, but rather the length of the session, such as 20 minutes or 30 minutes per session as the case may be. If a child is scheduled for both group and individual therapy, show the schedule for group and individual therapy separately.

Number of Sessions

The number of sessions present should include all sessions attended by the child during the period from the starting date to the closing date of therapy for that child. Similarly, the number of sessions absent should represent absences on regularly scheduled school days within the limits of the starting and closing dates of therapy for that child.

Starting and Closing Dates

The starting date is determined by the first day of therapy for the child. This date will probably not coincide with the date of the record; it is not expected to.

The closing date is the date of the last day of therapy for the child.

PART A. IDENTIFICATION DATA

A 1--Type of Class

If the child is enrolled in a regular classroom situation, check that item. If he is enrolled in a special day class check Special Class, as well as the type of special class in which he is enrolled. Individual instruction pertains to subject-matter instruction rather than speech and hearing therapy.

A 2--Grade Level

If a child is not yet in school, circle Preschool; otherwise circle the appropriate grade level. If the child is in a multigraded or ungraded classroom and the grades encompassed are not clearly specified, make the best estimate of his placement and circle the appropriate item.

A 3--History--Speech and Hearing Therapy

If the child has had no previous therapy, check that item. If he has had previous therapy in school or with any other agency, including private practice, indicate the number of years that he has received therapy. Round to the nearest half-year. Thus, a child might be shown as having received ½ year of therapy, 1 year, or 1½ years of therapy, or so forth.

A 4--Test Results

Academic. Show only those test results that have been obtained within the past two years of the beginning date of the school year during which the child is enrolled for therapy. Additional information, such as the name of the test and specific scores, can be noted in the margin.

Intelligence. Information about IQ is not restricted to the preceding two years. In the event that more than three sets of results are available, enter the most recent ones. The name of the test is to be entered in the space provided, since test results are qualified by the nature of the test.

A 5--Case Identification

If you, the clinician, identified the child through speech screening, circle that item. If the child was referred, circle Referral as well as the category of the individual who made the referral. If the choices provided are not adequate, write in after Other, the category into which the individual falls who made the referral.

PART B. FAMILY INFORMATION

B 1--Parents in Home

Circle one item under Mother and one item under Father so as to represent the nature of the mother and father figures in the home.

B 2--Siblings and Others in Home

Order of Student's Birth. Give the order of student's birth as 1st, 2nd, and so forth. If student is the product of a multiple birth, show his birth order as that of the set of births. If student is a twin (or triplet) and has two older siblings (products of single births), his birth order would be 3rd, for example.

Student Is a Twin. Enter yes or no in the space provided. Should he be a triplet, etc., enter triplet or appropriate the term rather than Yes or No.

Number of Siblings. The number of siblings entered should be the actual number of siblings living at home.

Number of Other Children (Not Sibs) in Home. If children are living in the home who are not siblings of the student, enter the number of children.

Number of Adults Besides Parents in the Home. Enter the number of adults in the home who are neither the student's parents or sibs.

B 3--Languages Spoken in Home

If you do not have definite information about languages spoken in the home, check No Information. Check English Only if you have definite knowledge that English is the only language spoken. If other languages are spoken in the home, write the language or languages in the blank following the word Other.

B 4--Speech Problems in Family

Check Yes or No only if you have definite information; otherwise check No Information. If others in the family have speech problems, write in the individual's relationship to the student and indicate the nature of the problem. Include not only information about the student's siblings and parents, but more distant relatives as well, when that information is available.

PART C. GENERAL HEALTH HISTORY

C 1--Health History

Check Yes or No after each of the items only if you have definite information. If you do not have definite information, check the column labeled No Information. In the event that some change occurs after the health history has been first filled in, new entries can be made using the color code. Should conditions change during a given year, so that the entry must be made in the same color, the date (day and month or month only) of the new entry should be shown.

C 2--Medical or Dental Diagnoses

This section represents the amount of medical information available on the child and should represent only those diagnoses made by physicians, dentists, or orthodontists. For example, if the child has not been diagnosed as a tongue thruster by a dentist or orthodontist, check No Information, even though, in your judgment, he may have this condition.

C 3--Medical, Dental, or Other Treatment

Referral Needed. Check the appropriate item in the left-hand column if, in your opinion, the child should be referred for examination and possible treatment by appropriate specialists.

Recommendations by Other Professions. If the student has been examined by a specialist, indicate the specialist's recommendation by checking the appropriate column following the nature of the treatment that would be required. Unless a specialist has examined or treated the child, do not fill in items in this section. This section represents decisions made by other professional personnel. If an orthodontist has examined the child, but advised against orthodonita, check Not Recommended; if orthodontic treatment is in progress, check In Progress.

Source of Information. For each kind of treatment that has been marked, such as orthodontia, indicate the source of information by filling in the blank at the far right. The most common sources of information are Records, Parent Interview, Observation, and Verbal Reports, the latter being divided into Verbal Report--Student, Verbal Report--School Personnel, Verbal Report--Physician, etc. In some cases, observation alone indicates that treatment has been given, as, for example, cleft palate surgery. In the absence of any record of information about the date of surgery and so forth, the source of information would be entered as Observation.

PART D. HEARING INFORMATION

D 1--Hearing Status

If the child does not have a hearing loss, check that item and show under Date, the date on which the screening (or threshold) test was passed.

D 2--Test Results

Screening Test. In some cases you will have an audiogram that represents the results of a screening test. In that case, fill in the audiogram on the record, indicating that the audiogram represents a screening test made at some specified dB-level, which is to be entered after Screening at _____ dB.

Under Frequency show each frequency tested and passed by entering a dash (--) in the appropriate cell. If the screening audiogram shows the level of loss at 4,000 or 8,000 Hz, write in the appropriate figure.

Threshold Test. If the audiogram represents a hearing sensitivity (threshold) test, check Threshold. Enter the actual sensitivity level in the appropriate boxes.

ASA--ISO. With either screening or threshold audiograms, be sure to indicate whether the calibration is ASA or ISO.

SRT--PB. If the speech reception threshold data are available, enter the binaural SRT in the appropriate blank. Results of discrimination testing should be shown as the per cent correct, and the SL (sensation Level) at which the test was administered should be indicated.

Fill in the date of the test, and circle the appropriate category of the individual who administered it.

D 3--Amplification

Indicate the make and model of the aid that the child wears and the setting at which he most usually wears it. Indicate the ear on which the aid is fitted by showing right or left or binaural (in the event that the fitting is binaural).

Indicate whether the student wears the aid full time or part time and show the aided discrimination score.

If the child uses a group aid either exclusively or part of the time as a substitute for his own aid, or should he use an individual auditory trainer, so indicate and include the make and the model of the group aid or trainer. Indicate, also, output and frequency response setting for each ear.

PART E. GENERAL SPEECH BEHAVIOR IN SPONTANEOUS SPEECH

E 1--Articulation--Spontaneous Speech

The information included in this section pertains to spontaneous speech. A form for recording an articulation inventory obtained under test conditions is provided on the last page. Vowels in spontaneous speech should be marked as either Normal or Deviant. Consonants should be marked as either Normal or Deviant. If deviant, also circle the kinds of deviations observed. Errors should be shown as either Consistent or Inconsistent.

E 2--Dialect

If the child uses general American dialect, circle None. If some other dialect is present, indicate whether it is Regional or Foreign.

E 3--Intelligibility

Indicate intelligibility by circling the appropriate item.

E 4--Fluency

If normal fluency is present, circle that item. Normal fluency includes the normal range of fluent and nonfluent patterns. Thus, one might regard a five-year-old as nonfluent but still within normal limits. In that case, Normal fluency would be marked on his record. If the child is nonfluent, circle Nonfluent as well as those characteristics that describe the particular nonfluency. A space after Other is provided for writing in additional descriptive terms.

E 5--Voice Quality

The description of voice quality follows that established by Fairbanks except that Denasal is shown as a voice quality rather than as an articulatory problem. In Fairbanks' classification, hoarse voice quality is the combination of breathy and harsh voice qualities.

E 6--Pitch

E 7--Loudness

E 8--Rate

If these attributes are normal, circle Normal. If any one of them is deviant, circle Deviant, and indicate the condition that makes it deviant. Blanks are provided after Other, which can be used for entering additional descriptive terms.

E 9--Language

If the length of the verbal responses is adequate for the child's age, circle Acceptable. If they are inappropriate, circle Inadequate and the condition observed that causes you to judge the response length to be inadequate.

Only a rough estimate of vocabulary can be made in the absence of extensive speech samples under a variety of conditions. Make the best estimate you can about whether the child has an Acceptable or a Limited vocabulary.

Under Grammar mark Acceptable if the child uses correct grammar and Poor if he makes grammatical errors.

PART F. COMMUNICATIVE RESPONSIVENESS

F 1--Responsiveness

This section is meant for recording of the child's communicative behavior. Under Deviant, Unresponsive means that the child does not respond either verbally or nonverbally. If the child relates well, is interested, and responsive, even though he has little or no verbal output, the item, Primarily Relates Nonverbally, should be circled. Slowness in Responding represents atypical delay between a request or a question and the child's responses. Irrelevant Responses represents usual or common responses but unrelated to the question asked or the topic at hand. Irrelevant Responses tends to indicate that the child is inattentive to others or had misunderstood the speaker's message. In contrast, Bizarre Responses represents responses that have strange or morbidly unusual content.

F 2--Eye Contact

This item represents the extent to which the child maintains appropriate eye contact in the communicative situation.

PART G. OBSERVED PHYSICAL BEHAVIORS

The items in Part G are self-explanatory.

PART H. SPEECH MECHANISM

The structures in Part H are to be evaluated with respect to their effect upon speech. The term Adequate is to be circled if the structure functions satisfactorily for speech, even though it may be atypical in some respect. If a structure is defective in some way that interferes with speech, mark it Inadequate and also circle the condition that causes it to be inadequate.

Type of Breathing (H.7.c)

Indicate the type of breathing used for speech. This subsection deviates from the adequate-inadequate classification found in the other sections of Part H.

PART I. EXPRESSIVE SPEECH OR LANGUAGE DISORDER

The five categories provided are intended to cover all expressive disorders without inferring causal conditions, since conditions such as cleft palate, hearing loss, cerebral palsy, and so forth do not describe speech characteristics. For example, a child with a cleft palate might have a voice disorder (nasality) and an articulation disorder. A hard-of-hearing child may or may not have voice and articulation defects.

I 1--Single Disorder

If the child has just one type of speech disorder, a check should be entered after the type of disorder.

I 2--Multiple Disorder

If the child has two or more types of speech disorders, check the most disabling one, as far as that particular child is concerned, under Primary Disorder. Check as the Secondary Disorder, the one that you rank second with respect to its disabling effect for the child. The third disorder would be entered under Tertiary Disorder. It is possible, of course, that the child might have more than three disorders. If so, add this information in the margin.

Severity

The severity scale 1 (mild), 2 (moderate), 3 (severe), is to be used to represent the severity of the disorder with respect to the usual range of the disorder. Thus, a child with multiple disorders might have three disorders, all of which are rated as severe. It is also possible for a primary disorder (rated as such because of its disabling effects) to be less severe than a secondary disorder.

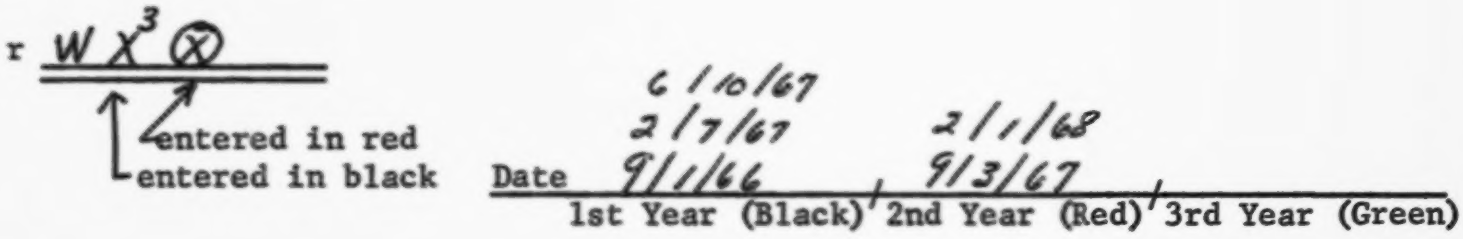
PART J. ARTICULATION RECORD

The format of the articulation record is similar to that of the Templin-Darley Test. All of the sounds that are included in their 50-item screening test are marked so that their norms can be used. A complete phonetic inventory of all sounds as singles is to be recorded, as well as the more important blends.

Since more than one articulation test is usually given during the school year, a combination of the color code and other symbols provides a system for following changes in articulatory behavior.

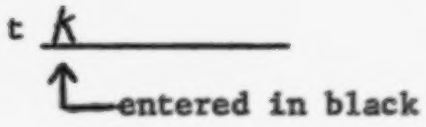
The dates of subsequent tests administered during the same school year are to be entered above the date of the first test, using the color code for that year. If a sound is incorrect on the first test and remains incorrect on subsequent tests during the school year, the original entry remains unchanged. If it is still incorrect the following year, a new entry is made in the appropriate color.

At such time as the sound is correct, the original error is circled. If some subsequent test elicits a new error, that error is to be shown in a square.


r W X³ ⊗
entered in red
entered in black
6/10/67
2/7/67
2/1/68
Date 9/1/66
9/3/67
1st Year (Black)
2nd Year (Red)
3rd Year (Green)

Examples:

These entries mean that on the first two tests (9/1/66 and 2/7/67) /w/ was substituted for /r/. By the time of the third test (6/10/67) the substitution became a distortion. The superscript 3 indicates the third, rather than the second test. The red entry shows that the sound was still distorted the following year. The distortion was circled to show that the sound was corrected at the time of the second test (2/1/68).


t k
entered in black

A single entry indicates that this error persisted during the year. A test administered on the date of testing for the second year revealed no error, thus no entry is made.

In summary, then, any black entry represents errors during the first year. Any red entry represents errors made during the second year. Any green entry represents errors made during the third year. This kind of code makes it possible to read changes in articulatory errors at a glance.

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